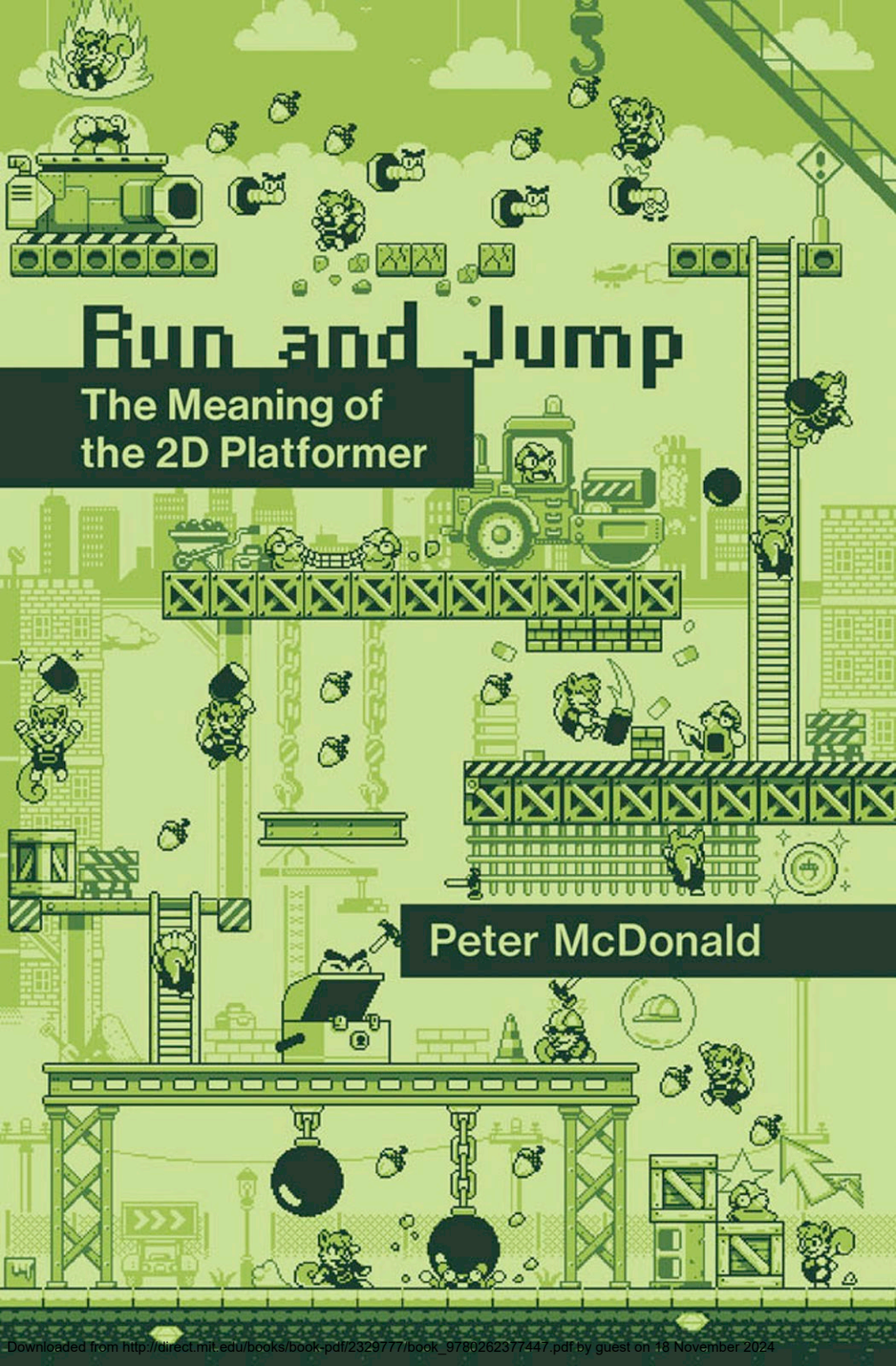

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Run and Jump

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Run and Jump

The Meaning of the 2D Platformer

Peter McDonald

The MIT Press
Cambridge, Massachusetts
London, England

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On Thinking Playfully

Many people (we series editors included) find video games exhilarating, but it can be just as interesting to ponder why that is so. What do video games do? What can they be used for? How do they work? How do they relate to the rest of the world? Why is play both so important and so powerful?

Playful Thinking is a series of short, readable, and argumentative books that share some playfulness and excitement with the games that they are about. Each book in the series is small enough to fit in a backpack or coat pocket, and combines depth with readability for any reader interested in playing more thoughtfully or thinking more playfully. This includes, but is by no means limited to, academics, game makers, and curious players.

So, we are casting our net wide. Each book in our series provides a blend of new insights and interesting arguments with overviews of knowledge from game studies and other areas. You will see this reflected not just in the range of titles in our series, but in the range of authors creating them. Our basic assumption is simple: video games are such a flourishing medium that any new perspective on them is likely to show us something unseen or forgotten, including those from such

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unconventional voices as artists, philosophers, or specialists in other industries or fields of study. These books are bridge builders, cross-pollinating both areas with new knowledge and new ways of thinking.

At its heart, this is what Playful Thinking is all about: new ways of thinking about games and new ways of using games to think about the rest of the world.

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Introduction: A Curious Persistence

A platformer is a deceptively simple kind of game. I have an avatar that runs right when I hold the right button and jumps when I press the jump button; I need to navigate that avatar to the end of the level while collecting things and eluding enemies. Some platformers might have more bells and whistles—special attacks or branching paths—but the basic formula is straightforward and calls forth the twitchy pleasure of arcades in the 1980s. Scratch the surface of that simplicity, however, and you will find an incredible range of emotions and attachments, intricate worlds and ideologies. *Run and Jump* is a book about what platforming games mean to players. It is about the child who sees a game on the store shelf and fantasizes about its cartoony levels. It is about terminology that magazines invent to praise and excoriate the genre. It is about the player's identification with a quality of movement. Above all, it is about designers constructing an experience and players interpreting their play.

Why focus on platforming games? To my eye, there is something peculiar about the genre's longevity that calls for explanation. No other kind of video game has had the same staying power or has maintained the same continuity of design elements. Nintendo's *Donkey Kong* stormed arcades in

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1981 and introduced the basic running and jumping action that has anchored the genre for forty years. For all the subsequent innovations, it is easy to imagine a world where *Super Mario Bros*. (1985) is a new release in 2024 and still finds critical acclaim. As a result, platforming games create continuity between generations of players. Standout platforming games symbolize the home consoles of the 1980s and 1990s in the collective imagination and became the public face of the indie game movement through titles like *Braid* (2008), *Super Meat Boy* (2010), and *Fez* (2012). More recently, titles like *Katana Zero* (2019), *Noita* (2020), *Ori and the Will of the Wisps* (2020), and *Metroid: Dread* (2021) have been nominated for and won at independent and mainstream award shows. Beyond their critical and commercial impact, platforming games have been important objects to think with, and they figure implicitly and explicitly as a model in design discourses. The genre has been remarkably flexible at incorporating new styles of play, generating innovative mechanics, and speaking to new historical moments.

If the ongoing prevalence of platforming games starts to answer for their place in this book, it also raises new questions about that cultural power. Why did *Donkey Kong* captivate American arcade audiences? What made Mario and Sonic such powerful mascots? What cements these games in the nostalgic identification of gamers? Why did indie developers turn to the platformer to reflect on normative design? What allows the same arcade mechanics to take on radically new connotations? Questions like these that try to reckon with the cultural force of the genre have motivated my attention to the meaning of these games.

There are commonsense answers to some of these questions, but they strike me as partial. For example, one explanation

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for the continued production of platformers is that the simple mechanics and pixelated art make them easy to program, animate, and execute on older hardware and mobile devices. Even on a technical level, I think this argument is flawed; in the game design classes I teach, the default settings of Unity and the freely available assets often make it easier for students to build a first-person shooter. Furthermore, that argument fails to explain the marginality of other simple genres like the shoot-'em-up. A second explanation is generational. It argues that the commercially successful independent game designers of the late 2000s were the first children to grow up immersed in video game culture, and consequently their games show a historical self-awareness.[1] The generational math is a little fuzzy depending on when you start counting (1972 with the Magnavox Odyssey? 1977 with the Atari 2600? Or with the first home platforming games in 1982?) and fuzzier still depending on the career paths open to an independent developer (starting as a hobbyist in high school? or only after getting experience in the game industry?). Putting that time line aside, indie developers could equally have chosen to rejuvenate other historical genres: point-and-click adventure games, puzzle games, maze games. A third kind of explanation attributes the success of the genre to the genius of its designers. Platforming games, so the argument runs, are important because Shigeru Miyamoto crafted them exquisitely and left a legacy of imitators. However, that dramatically simplifies a complex history of production, reception, and taste that retroactively makes the process appear inevitable.

All of these answers have a grain of truth, but they try to solve the problem from the outside. When the power of platforming games is framed through the particularities of technology, the coincidence of nostalgia, or the accidents of genius,

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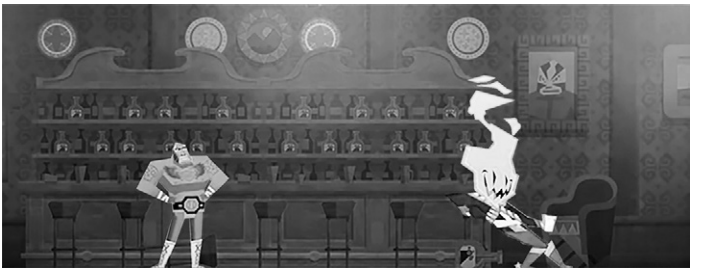

Figure 0.1
Silhouettes communicate character and emotion in *Guacamelee!* (2013).

nothing about the games themselves enters the picture. In the following chapters, I argue that we cannot bypass a thick description of all the bits and pieces that make up platforming games—their mechanics, organization of space, hordes of enemies, piles of coins. Attending to these elements roots the genre's popularity in the desires and anxieties of a larger culture. It matters, for instance, that the avatar typically occupies a small portion of the screen—emphasizing the gestural poetry of the silhouetted body over the expressive movements of the face or the interiority of the first-person camera (figure 0.1). When and where the genre succeeds, we can expect an investment in such aestheticized bodies. Taken in isolation, this one detail of the genre is of small importance, but it is part of a larger set of traits that go a long way to explaining the power of platformers.

The Platformer as a Genre

Framing the success of these games in terms of genre means defining the platformer and its boundaries. *Genre*, however,

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is a slippery term. Sometimes it points to necessary and sufficient features of a work—for example, a poem is a sonnet if it has fourteen lines, ten syllables per line, and a specific rhyme scheme. In such cases genre becomes a set of constraints the artist imposes on her creative process. More often, genre appears as a collection of common features that establishes a contract of expectations with an audience. A detective novel need not have a femme fatale, take place in a decaying and amoral Los Angeles, with a lone male detective who has a drinking problem; but if a novel has all these features, a reader can expect it to fit squarely within the hard-boiled subgenre. Against these more definitional approaches, we can also think of genre as a practical and historical term without any ideal core. In this sense, genre gets deployed by a designer to explain the mood of a game; then marketing people use genre in an advertising campaign; the game is disparaged as generic in a critical review; and picked up by a fan of the genre. Each time, the term *platformer* might mean something quite different to the person using it. By centering the history of usage, we can understand how genres stretch to include radically different games or collapse and become incorporated into other categories. For several years in the 1970s, for instance, the mass success of *Pong* (1972) and its numerous clones transformed "pong" games into a distinct genre before quickly fading.[2]

All of these conceptions of genre play out in the history of 2D platforming games. That history starts with *Donkey Kong*, whose massive success in the arcades spawned so many clones that, like *Pong*, we can talk about Donkey Kongesque games as a minor genre. At first, the reasons for *Donkey Kong*'s success are obscure, and the copycat games establish the genre as one of giant monkeys, ladders, and upward progress as much as jumping (figure 0.2).[3] Soon, arcade games began to experiment

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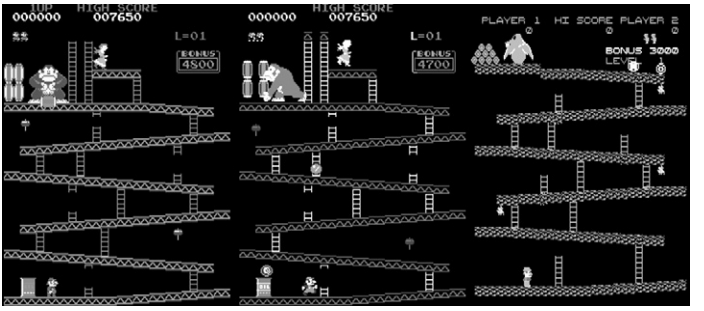

Figure 0.2
From left to right, *Donkey Kong* (1981), *Crazy Kong* (1981), and *Logger* (1982).

with other ways of integrating *Donkey Kong*'s jump mechanics into the life-or-death play of coin-operated machines. *Jump Bug* (1981) gave the player an unstoppable forward momentum, *Joust* (1982) made jumping a tool of multiplayer combat, and *Jungle King* (1982) added bottomless pits. Home consoles took jumping in another direction, slowing the pace and using the additional memory of cartridges and computers to unfold the game over dozens of screens. Games like *Pitfall* (1982), *Loderunner* (1983), *Jet Set Willy* (1984), and *Pac-Land* (1984) all made exploration of 2D space into a pleasure and a goal—restructuring the genre around a narrative experience that transcends the moment-to-moment drama of the arcades.

In 1985, the North American launch of the Nintendo Entertainment System (NES) coincided with the release of *Super Mario Bros*. in a major milestone for the genre. In one sense, *Super Mario Bros*. simply rehashed innovations made by other games—scrolling levels, enemies that respond to the player, power-ups, an unfolding story. In another sense, *Super Mario Bros*. was the first game to establish a clear internal

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connection among these different elements. That design logic was at the root of a new sense of platforming as a genre. The efforts of the whole development team, including designers Shigeru Miyamoto and Takashi Tezuka in intimate connection with programmer Toshihiko Nagakgo, brought out a complex interaction between jumping and 2D space that created a new and emergent style of play. Subsequently, jumping and 2D space become the necessary creative constraints of the genre, and the first two chapters of this book are dedicated to understanding what they convey to players.

With the NES we enter a golden age of platforming games. Flagship mascots would come to define the identity of several consoles—Mario on the NES, Super Nintendo Entertainment System (SNES), and Nintendo 64 (N64); Sonic on the Sega Genesis; Bonk on the TurboGraphx-16; and to a lesser extent, Crash Bandicoot on the PlayStation. From 1985 until 1997, 2D platforming games were prolific, well made, and formally innovative. Several new subgenres were devised in this period. Run-and-gun games, like *Contra* (1987) and *Metal Slug* (1996), add shooting mechanics that interact in novel ways with the avatar's vertical position and the timing of a jump. Adventure platformers, or "Metroidvanias" (a portmanteau of *Metroid* and *Castlevania*) map out sprawling mazes in which players can progressively discover new abilities and evolve their avatar over time. Puzzle platformers transformed spatial movement into a site of deliberation and planning in games like *Solomon's Key* (1986) and *The Lost Vikings* (1993). If *Super Mario Bros*. organized the messy component elements of the early arcades, the games of the subsequent period developed the genre's commonplaces. The third and fourth chapters of this book examine the tropes of enemies, bosses, power-ups, collectibles, and secrets.

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In the late 1990s, with the release of the N64 and PlayStation, the technical and cultural push toward 3D environments dramatically transformed gaming. This is often thought of as a period of hibernation for the 2D platformer.[4] Although 3D platforming games had an exciting efflorescence, the connection between jumping and 3D screen space strikes me as substantially different from the games I track. While 3D genres may have dethroned platformers as the dominant style of play, it is a mistake to see a simple downturn in their popularity after 1998. The idea that 2D platformers went into hibernation not only undercounts their importance on handheld devices like the Game Boy Advance (GBA), but also ignores a lineage of major innovation. Several new 2D platforming dynasties managed to simultaneously invent styles of play and to top the best-seller lists, often by adapting ideas from other genres into hybrid platformers.[5] The *Rayman* series (1995–2019) moved toward music and rhythm games, the *Oddworld* series (1997–2020) added elements of strategy and god-games, *Super Smash Bros.* (1999–2018) integrated fighting game combos and strategy, and *Viewtiful Joe* (2003–2004) mixed in beat-'em-up mechanics. Rather than initiating clear subgenres, each of these series is something of an anomaly that synthesizes multiple competing genres with virtuosity but that subsequent imitators have had a hard time reproducing.

Furthermore, the idea that independent developers revived the genre around 2008 also misses the earlier prolific experimentation with platformers by ROM hackers, web developers, and hobbyist programmers in the early 2000s. Some of that enthusiasm can be traced to the public release of NES, Genesis, and SNES emulators in 1997. During a moment of web history when piracy was commonplace, these emulators introduced

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many people to a huge archive of games in an accessible and free format—including a preponderance of platformers. Emulators then helped to popularize PC gamepads, creating a user base for future platforming games that require complex precision controls. The process of ROM hacking—editing the source code of an emulated game in a .rom file, often by trial and error—allowed enthusiasts to experiment with and alter their favorite games.[6] Another important influence was Macromedia Flash, a popular tool for building early browser games.[7] Flash emphasized vector graphics and 2D movement, and its popularity for web development and animation meant that it was accessible outside the game industry. Starting with the release of *Alien Hominid* in 2002, a flood of crass, half-baked, and experimental platforming games appeared in a wide range of places. Works like *Cave Story* (2004), *N* (2005), *La-Mulana* (2006) *Within a Deep Forest* (2006), *Knytt* (2006), *Noitu Love and the Army of Grinning Darns* (2006), and *Frozzd* (2007) are the flowers of a rich and widespread culture of borrowing, hacking, and reimagining the genre. These games often appear as a joke, a prototype, or an homage without any clear commercial aspirations. The period between 1998 and 2008 was metamorphic and frothy, not one of stagnation.

The rise of the indie platformer in 2008 with games like *Braid* and *Spelunky* (2008) does not represent their reemergence after a long hiatus but is a new model for commercializing small projects in digital distribution networks like Steam and Xbox Live Arcade. The results of commercialization for the platforming genre have been complex. New markets reshaped independent projects by imposing a demand for polish and depth. For some developers, this was a welcome opportunity; it helped establish an auteur culture that treats platforming games as high art. Designers took several approaches to

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establishing the cultural legitimacy of their games: *Braid* and *Thomas Was Alone* (2012) offer a metacommentary on the genre and its history, *Limbo* (2010) and *Inside* (2016) turn to evocative forms of visual storytelling, and *The Swapper* (2013) and *Celeste* (2018) use procedural rhetoric to invest game mechanics with allegory.

For all the benefits that funding brought to artists, the pressures of popular taste and a prestige economy exuded a homogenizing force tinged with sexism, homophobia, and racism. Moreover, the nostalgia and difficulty of platforming games make them a bastion of the toxic gamer fandom that erupted as part of Gamergate, a reactionary movement that sought to police the identity of "true" gamers by harassing and threatening women and queer folks in the community.[8] It is with some ambivalence, then, that the alternative games scene took up the genre. Designers including Anna Anthropy, Terra Lauterbach, Liz Ryerson, merritt k, and Loren Schmidt used the form in order to dissect it and render it strange, troubling, and queer in *Redder* (2010), *suteF* (2010), *Problem Attic* (2013), *Obéissance* (2015), and *Strawberry Cubes* (2015). Progress in *Redder*, for instance, slowly corrupts the game's visual elements before they disappear entirely, troubling any simple pleasure in solving puzzles and collecting items (figure 0.3). Both the well-funded prestige platformer and the resistant deconstructed platformer add something profound to the genre while taking some distance from the straightforward pleasures of earlier games. We might think of this period as a kind of modernist assertion of singularity over genre, where the signature of the artist is the ability to rework and transcend the materials from which an artist draws. These platforming games demand that they be considered sui generis, especially when they work through genre.

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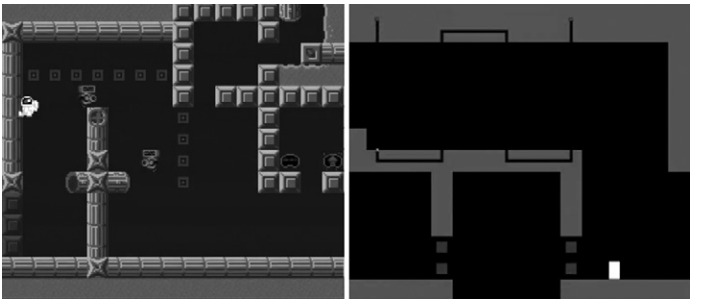

Figure 0.3
The graphical elements in *Redder* (2010) at the beginning of the game (left) are slowly removed over time to reveal abstract collision boxes (right) and deconstruct the game.

In this cursory and incomplete history of the platformer, we can make out some lines of force that might cause people to draw different generic boundaries. An attachment to one period or another might make some features appear more prominently. An investment in profitability or mainstream dominance might obscure the ways the genre has been put to other ends. A story of inevitable technological development might relegate platformers to a transitional stage in the evolution of games. A personal history of hard-won skill might create defenses against new pleasures and meanings. All of this is to say that the genre is a site of contestation that is inextricably personal, political, commercial, and critical. The definition of the 2D platforming game is caught up in ideologies of masculine mastery and fragility, neoliberal forms of autonomy and competition, a culture industry that cynically recycles nostalgia, a punk and low-brow subversion, and a romantic ideal of art.

As a way of holding these conflicting ideas together within some larger imagination of the genre, I employ a structuralist

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approach. For structuralism, any change always needs to be understood relationally. Remove jumping from a platformer, for instance, and you change the genre. But if a grappling hook establishes a different but analogous relation between the avatar and the world, then the game will still feel like a platformer. Equally, we can think of the boundaries of the genre as existing in tension with other kinds of games. Two-dimensional platforming games have much in common with fighting games, and especially beat-'em-ups, because they use the same camera perspective. However, platformers can be distinguished by the relative speed with which the character moves across an unfolding level—hence the synonym of "side-scrolling games" for platformers. The distinction is not a formal quality of either genre by itself—there is no minimum speed at which a game flips into beat-'em-up territory—but part of a set of relative degrees that hold the two in tension. A structural approach can help us see how different communities emphasize one or another possibility within the genre.

Game scholars have established some of the relations that hold genres in tension, but these are often framed as formal and abstract typologies. Platforming games are grouped as part of "action" games which stand in contrast to "strategy," "adventure," and "simulation" games.[9] The differences among these big groupings are then aligned with one or two significant variables: how a game deals with time, the kind of decisions a player can make, how a game represents the world. This kind of approach paints in strokes that are too broad. The formalism and history at stake in action games tells us little about the individual case of platforming.[10] To see a properly structuralist approach to a specific genre, we have to look to other media.

Tzvetan Todorov's *The Fantastic* is one of the most complex and nuanced structuralist accounts of how a single genre

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shapes literary production. Todorov writes about fantastic tales, a small but compelling group of stories defined by a peculiar quality of their narration. In a fantastic story, neither the protagonist nor the reader can be sure whether the events of the story are real or supernatural.[11] Suspended between two interpretations, the fantastic is always in danger of resolving into a different set of genre conventions. If realism predominates, then the story becomes uncanny, and the supernatural is explained as a series of improbable coincidences. If the supernatural is acknowledged as real, then the story becomes marvelous—and believing in elves and magic is the price of admission. To be fantastic, the genre needs to hesitate between these interpretations, and that uncertainty has effects on its style and subject matter. An author must negotiate linguistic conventions so that the appearance of a ghost does not seem allegorical, or the description of a dream landscape does not seem like mere poetic flourish. They must stick to linguistic registers that convey the fictitious but literal character of the story. For Todorov, genre is defined entirely through negation: the fantastic is not-uncanny, not-marvelous, not-poetic, not-allegorical, though it exists in relation to each of these terms. This focus on relations, above and beyond what they relate, is the marker of structuralism.

A structural approach combines several of the strengths of other kinds of genre analysis. By defining genre in terms of relations, dramatic changes in the form and content of platformers need not lead to confusion with other genres. At the same time, structures themselves are historical and can rupture. As Todorov argues, "Every work modifies the sum of possible works, each new example alters the species."[12] Unlike static typologies, a structure exists as part of an ongoing interpretive conversation. Moreover, works that defy genre

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conventions are often where structural analysis is most meaningful, because the differences reveal a cultural argument. As Fredric Jameson persuasively argues, a structural description "directs our attention to those determinate changes in the historical situation which block a full manifestation or replication of the structure."[13] If we have a picture of how a genre should work, we are in a better position to see the ways a given game diverges from that logic and ask why. The conflicts that arise in the history of the 2D platformer thus become social messages internal to the genre itself, representing approaches that any game can draw on to create a consensus among different audiences.

Consider the arrival of 3D games in this light. In the heyday of platformers during the late 1980s and early 1990s, we can identify two competing definitions of genre: one emphasizing visual elements, the other mechanical ones. Visually, platformers distinguish themselves from maze games and shoot-'em-up games through a profile camera and scrolling screen. Mechanically, platformers were the only genre that relied on jumping. Three-dimensional games significantly disrupt and redraw both boundaries. They show that platforming can happen in other kinds of visual spaces, and they introduce jumping elements into many other genres (first-person shooters, action-adventure games, and racing games). Free roaming 3D platformers like *Banjo-Kazooie* (1998) actively work to dissolve the 2D platformer and put a new definition in its place. In contrast, a game like *Klonoa* (1998) makes use of 3D space to reestablish the old boundaries in a new way, by pinning the avatar to a 2D plane that is continually carved out of its larger world (figure 0.4). Where visual style previously vied with mechanics to define platforming, *Klonoa* makes a case that the genre depends on their interrelation. It makes an argument by

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Figure 0.4
The camera keeps the player's avatar, Klonoa, in profile as it rounds a corner in 3D.

building a coalition between the investments that different audiences attach to visual and mechanical conventions. In the remainder of this book, I take up this structuralist approach as a tool to show how the meaning of form is actively and collaboratively constructed.

Structuralism, Semiotics, and Video Games

Structuralism is a particularly powerful tool for revealing meaningful connections in the interstices of large, mechanical, and abstract systems like games.[14] The French linguist Ferdinand de Saussure developed structuralist methods in his attempts to break down the basic elements of language. He

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saw the communicative function of words as the result of relationships internal to language rather than between words and the world. He specified three interlocking traits that make meaning possible. First, a word is made up of smaller units such as phonemes that are themselves meaningless except insofar as they create ideal contrasts that help to break up the continuous fluctuations of sound into discrete bits. Second, the combination of these bits into meaningful words or sentences depends on their difference from an infinite number of other possible arrangements of those bits. Finally, Saussure argues that language does not connect words and things but signifiers and signifieds, which are both ideal phenomena determining each other like two sides of a sheet of paper: cut or bend one, and you alter the other.[15] By framing language as an interlocking structure, Saussure helped to demystify meaning and provided a framework for identifying other systems of signs in a general science called semiotics.

While structuralist semiotics maintained a deep debt to spoken and written language as its paradigm of meaning, it enjoyed a widespread use in the middle decades of the twentieth century within a variety of academic fields, including anthropology, historiography, literary criticism, film theory, and psychoanalysis. More relevant to platformers, early scholars of new media drew substantially on an expanding body of structuralist theory. Games and hypertext fiction seemed to literalize the ideas of earlier structuralists—presenting differential relations as a series of choices, using a finite set of rules to generate infinite combinations, and giving the reader control over her reading experience. Through the 1980s and early 1990s, writing by Marie-Laure Ryan, Michael Joyce, Lev Manovich, Richard Grusin, Jay Bolter, and George Landow made the connections between games and structuralism

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explicit.[16] In these theories, games liberated tendencies that were already at work in books, and video games could ultimately be reincorporated as one more form of textuality. This perspective is especially understandable at a moment when text adventure games were the primary genre subject to critical and artistic engagement.

As the study of video games developed and began to distinguish itself from new media more broadly, a new generation of critics questioned the subsumption of games by text. In 1997, books by Espen Aarseth and Janet Murray raised significant problems with the semiotic paradigm. Aarseth argued, against the new media theorists, that the cybernetic nature of game signs undermined any attempt to categorize or theorize them in advance of their specific manifestation within this or that game.[17] Murray pushed for a more general recognition of medium specific qualities of computation and its effects on narrative and cultural production.[18] Much has been made of the differences between Aarseth's interest in the formal qualities of games and Murray's aesthetics of storytelling in the narratology-versus-ludology debate, but this framing obscures the similar place from which both authors began.[19] They both inherited a field that treated games as texts to be studied by literature departments with poststructuralist tools.[20] Both emphasized the ways that games necessarily expand those paradigms and both rejected the kinds of meaning that structuralism reveals. The academic study of games was founded on a rejection of an overzealous application of structuralist methods by early new media scholars in a move that had long-lasting consequences on our ability to interpret games.

That foundational negation shaped game studies by repressing some approaches and cultivating others. Aarseth's criticism of semiotics created a lasting skepticism toward attributing

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meaning to abstract game elements. In recent years, a new generation of critics have drawn on innovations in semiotic theory to try and overcome his criticisms.[21] Even so, their work tends to stem from nonstructuralist traditions in semiology, such as the work of Charles Pierce or cognitive science. Conversely, in the absence of structuralism and its modes of textual inquiry other more pragmatic approaches have flourished. Ian Bogost's concept of procedural rhetoric—whereby game rules make an argument—captured the imagination of many critics interested in the communicative potential of games.[22] Rhetoric's focus on argument, persuasion, and purpose is missing in many structuralist theories. Because the early game studies scholars swept clean the theoretical baggage of textuality, procedural rhetoric could appear as the dominant way games communicate.

Now this story of structuralism's exclusion might be chalked up to the accidents of disciplinary history except for a further twist. The concept of meaning developed by Saussure is itself modeled on games. Roy Harris, a translator of Saussure, has made a study of the extended chess metaphors throughout *Course in General Linguistics* and argues compellingly that they are crucial to Saussure's theory and actually distort his view of language to be more game-like.[23] Similar game metaphors appear at key explanatory moments in the work of other structuralists including Claude Lévi-Strauss, Roland Barthes, Fernand Braudel, and Algirdas Greimas.[24] Games provide an ideal place for the abstract, arbitrary, bounded, and ideal rules that organize meaning in a structuralist framework. Subsequent poststructuralist revisions have, if anything, made games and play even more central to the theory.[25] New media theorists were able to easily assimilate games to a textual paradigm because that paradigm was implicitly about games all along.

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When game studies scholars rejected structuralist semiotics, therefore, they were excluding something central to the way games communicate.

By returning to platforming games through a structuralist lens, my goal is not simply to apply one more academic theory to games. I am convinced by many of the criticisms of structuralism and think that it has some fundamental flaws.[26] Still, it is crucial to recover a whole range of ludic meaning that has been foreclosed by the discipline.[27] The problem is how. Aarseth's criticism still holds: games procedurally decompose and recompose signs in ways that undermine any general system of semiotics. Games cannot be texts because they do not share a language; each one organizes its world along new and different lines. What looks like a limitation from one angle, however, is an opening from another. Rather than a grand theory of game signs, we can develop local and ad hoc semiotic theories specific to a single game or genre. In that sense, each game is a language rather than a text, and it is composed of signs that both the player and the semiotician must learn anew through play. A blow against the generality of semiotics becomes an invitation to endless experimentation that transforms every player into a researcher.

* * *

This story might seem convoluted, but the point is simple: our resources for thinking about games have been impoverished. The differential webs of structuralist thought are beautiful and reveal endless shimmering subtleties in even the simplest elements of design. Structuralist semiotics shows that we always say more than we mean to; it reveals eddies and currents of communication that pull us unknowingly into new thoughts and ideas. Alongside the arguments of procedural rhetoric,

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I want a procedural poetics, procedural metaphors, atmospheres made of procedures, feelings organized procedurally, each one irreducible to a univocal argument or singular effect. In such an expansion of ludic meaning, the procedural cannot be isolated as one register separate from the visual, auditory, or textual; they all mingle and enter local relationships that cannot be universalized. This book is about dallying with the mess in platforming games.

What follows are a series of vignettes about aspects of platforming games. I dive into topics that at first glance seem merely functional: the distribution of abilities to different buttons, the height of a passage, the timing of an enemy's attack. In each, I work to bring out their rich and ambivalent meanings. The four chapters organize a handful of short investigations into larger themes characteristic of the genre: jumping, level design, enemies, and items. My hope is that by creating an assortment of tools, a wide range of readers will find something useful here. Avid players of platforming games will be able to deepen their appreciation through readings that explore the form and its pleasures. Humanities educators interested in bringing games into their classroom will see practical strategies for translating the skills of close reading and interpretation. Game designers will discover exercises at the end of each chapter for honing expressive and communicative choices. Academics in game studies will encounter a fresh argument about the relationship of genre, form, and meaning. Ultimately I hope readers feel free to pick and choose from the claims in this toolbox, discarding some and adapting others, for the expansive work that a semiotics of games opens onto.

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1 Jumping

Nothing captures the spirit of platformers like jumping. A player runs at full speed up to the edge of a chasm and soars across the open space confident in her ability to traverse it (figure 1.1). In a platforming game, players can do many things—they run, duck, dash, slide, shoot, crawl, grapple, punch, and climb—but jumping uniquely unfolds the one-dimensional line of movement into a dynamic space of decisions. It establishes a universal equivalence for the 2D screen, where everything from fireballs to dialogue boxes can be treated as a platform to jump off. It makes possible a range of challenges, a space of exploration, and a sense of improvisation. Without jumping, platforming games would not exist as a genre.

This chapter is about the meaning of jumping in 2D platforming games. The idea that jumping has a meaning would surprise some players, but in reality, jumping is saturated with associations and significance. Jumping holds nostalgic childhood memories, conjures up scenes of game designers talking about their craft, draws in moral panic about addiction, and tethers academic accounts of procedural rhetoric. Most important, the player attaches a meaning to jumping as she plays. That experience of acting in a game world is an underexplored dimension within the study and design of games.[1] True, game

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Figure 1.1
A leap into the void from *Ori and the Blind Forest*.

designers have developed rich tools for tweaking and adjusting an experience, and game scholars have gotten adept at surveying a whole work and seeing the interconnection among its elements, but on the microscale of a single mechanic, the moment-to-moment experiences remain mysterious. In this chapter, I detail the layers of meaning within the simple act of jumping.

Jumping is always an abstraction. Each jump looks a little different, happens in a new part of a level, and the player intends to accomplish something specific with it. There are different scales of abstraction that we can use to think about the player's relationship to jumping, zooming in or out to focus on some details over others. At its most concrete, each of the thousands of jumps a player makes over the course of a game is singular and unique. As the player learns how to play, the individuality of each instance fades, and the choice between kinds of jumps—short hops, butt stomps, wall jumps—takes on more importance. The player understands all of these ways

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of jumping within a larger context of how the other available mechanics differ in function and execution. For a player familiar with the genre, jumping also evokes expectations about potential pitfalls and outcomes. Finally, the player brings a horizon of experiences from her own body, from watching people jump on television or film, or from the symbolism of dreams, and these experiences shape the player's interpretation of a jump. By analyzing these layers of abstraction, inevitably intertwined in practice, this chapter starts to articulate the meaning of jumping.

In the Introduction to this book, I made the case that structuralist semiotics can help describe the player's construction of meaning. I argued that, in those terms, each game should be understood as a generative language rather than an individual text. This chapter fills in the details of that analogy. Structuralist semiotics begins its account of meaning by identifying and decomposing minimal units of a language—morphemes, phonemes, graphemes—and designers have coined *ludeme* as an equivalent for games.[2] I develop those minimal elements by examining how they exist in relations defined by difference and how those relations operate.

The Arc

The most immediate experience of jumping is an individual act. A player presses a button or a series of buttons, and her avatar traverses the screen in a certain way at a certain time. It is *this* jump and no other. The singularity of jumping is clearest when a player is learning how to play. In that stage, the player has no experience to draw on to contextualize an action. She may think about what she wants to accomplish, look down at the controller to ensure her thumb is in the right place, and

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practice this skill in artificial isolation from the other mechanics she has already mastered. In these initial tests, each jump is measured as a success or failure in its own terms and not yet as a general skill. Brendan Keogh calls this an embodied literacy, and it is like having to pay attention to the shapes of letters while learning the alphabet in order to recognize the unity of "A" and "a" and "*a*".[3]

A single jump is already a complex act. Often it is performed with other acts of running, ducking, or shooting that occur simultaneously or in quick succession. Even in isolation, the player's attention is split between an on-screen response and the pragmatic context in which she is attempting to perform that action. A player jumps in order to accomplish something specific in the game world, and the meaning of each jump is directly tied to that goal. At one moment, she wants to get on top of a platform, at another to avoid an enemy, at a third to overleap a pit. In each case, her jump is part of an intentional and directed action. Moreover, as the player develops embodied literacy, her goals take precedence over the quirks of movement in the same way that the font and typeface of a word are normally in the background when we read. Jumping in a game is like any other act that we have practiced until it becomes a habit, so that the know-how is ready-to-hand when we need it. The game world offers a horizon of possible actions of the form "I can . . . in order to," which become the subject of self-conscious exploration only when an outcome does not match the player's expectations.[4]

It is common to use verbs like *jumping* to capture this language of action, and game designers often treat verbs as shorthand for a player's primary interactions.[5] However, verbs are also ambiguous. They group together several acts that each might mean something significantly different to the player.

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Nis Bojin argues that we should instead think in terms of situated actions, which he calls "ludemes." He gives jumping as a primary example:

> A mechanic might then consist of a simple interaction such as a button press which translates into a character jumping on-screen, and which may or may not have distinct associated parameters such as gravity, drift or duration. A ludeme, however, moves from the technical interaction to a "choice-experience," which might have a character using the aforementioned jumping mechanic to move from one floating block to another floating block while taking oncoming fire in a 3D space where the penalty of falling is character death.[6]

Situating the verb is important because it connects the mere act to something richer that the player wants to do, accomplish, or feel; as Bojin says, it is part of a choice. Importantly for this semiotics of action, the player's intention is not purely subjective. The game explicitly structures the range of possible choices, such that a given action communicates an objective intention and strategy. Watching someone with an embodied literacy, it is possible to explain what she is trying to do and why. In other words, a ludeme is essentially a sign that conjoins the act (as signifier) to a strategy (as signified).

There is a lot to unpack in this ludic conception of a sign. Any single signifying mechanic is itself a complex term composed of button presses, the resulting action, and any visible changes to the state of the game. At the same time, the signified choice can only be understood within the full pragmatic context of play. Bojin lists several contextual factors that might change the meaning of a jump, but only to the extent that they affect strategic considerations. Jumping over a pit where "the penalty of falling is character death" matters only if it changes how the player acts—for instance, by starting sooner and jumping farther than necessary. What we have

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access to, however, is not the idiosyncratic intent of a single person. When a player jumps on an enemy, she may feel rage or regret without either emotion registering in the jump, but her action does express a decision to attack. Signs are situated but they are also communicative. Through action we gain insight into a game's system of possible strategies, desires, and motivations, so that in each jump, there is an ideal element that other players can recognize. Jumping has as many meanings as the choices it affords, and it slots the player's impulses into a systematized set of available moves.

The meaning of jumping at its most concrete, then, depends on the particular use a game puts it to. Across the genre we can recognize at least a few commonalities. First, jumping is a method for traversing space. That might sound simple, but it differentiates jumping from strategies like shooting an enemy or waiting for that enemy to pass. More specifically, jumping describes an arc. Other forms of movement—running, climbing, dashing—traverse a straight line, and the player chooses jumping when she requires a more complex path to a goal. An arc has two benefits on the 2D plane. First, it allows the player to approach problems from a variety of angles. Many tasks require the player to correlate ongoing changes between the avatar's vertical and horizontal position. Jumping onto a platform, for instance, requires the player to first rise above it, then move over the top of it, and finally descend onto it. Stomping on an enemy requires a similar management of complex vectors. A jump integrates several transformations of speed and direction into a unified motion that is easy to control. A deft player can select an appropriate speed and angle to weave through midair mazes of dangerous spikes and flying projectiles where linear motions would confuse and complicate things.

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A second strategic advantage of jumping is temporal. By jumping, the player gains time and space to adjust her position in the air and anticipate how the next few seconds will unfold.[7] Compare that to dashing, where the player presses a button, and a frame later, the character has zipped to the end point of the dash. Jumping could work like dashing and cause the player to traverse the arc instantaneously, but it never does. Instead, platforming games use jumping to transform time into a resource—the player gives up control to gravity in exchange for a moment of freedom to fall and reflect. Every arc differs slightly, but they generally afford the player a complex path and the time to navigate it.

Beyond its utilitarian benefits, a player may jump for aesthetic or emotional reasons that can be visible within play. Parabolic motion is one of the oldest pleasures of video games, dating back to the streaking arc on William Higinbotham's oscilloscope screen in *Tennis for Two* (1958). Many players will jump when there is no strategic benefit simply to experience the arc itself.[8] Like a ball traversing the air, we chart the trajectory of the avatar by imagining lines of force radiating into the future toward a landing spot, making its beauty into a virtual halo. Its motion tells a microscopic but dramatic story of rise, plateau, and descent in every action, full of hope and fear. A player might feel elation for a perfectly timed bounce or frustration with her poorly performing fingers. While these can only be speculations about the joy contained in jump, we can point to certain actions as evidence for some such exorbitant motive whenever a player is running across an empty plain and decides to hop into the air. Just as each jump has its pragmatic goal, sometimes there are deviations that can only be explained through the more poetic connotations of intent. Even at this small scale, there is a meaning to jumping,

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however fleeting and subconscious. If we were charting these singular little arcs, we would see a giant sketch pad where expressive and looping doodles wander through the air.

Hop, Skip, Jump

Not all jumps work the same way, and not all jumps can be used to the same ends. A second question, then, concerns the player's ability to distinguish one kind of jump from another and, conversely, the identification of two jumps as iterations of the same sign. *Super Mario World*, for example, gives the player at least two different kinds of jump. To perform the first one—let's call it a normal jump—the player presses the B button. Mario then rises four blocks up into the air and moves five across from a standstill; with a running jump, the height increases to six blocks and the distance to twelve.[9] In the accompanying animation Mario raises his arm into the air, and at the top of his arc, his hat momentarily floats off his head. If the player presses the A button instead, Mario performs a spin jump that travels one block less vertically and horizontally under the same conditions (figure 2.2). During this jump Mario quickly twirls through the air—which somehow gives him the extra ability to bounce unharmed off spiky enemies and to break certain blocks. The verb *jump* accurately describes both actions even though they are clearly different. How do we understand that difference?

One might be inclined to identify a button, an animation, or an on-screen result as the sine qua non that differentiates game mechanics. For instance, when the player presses a different button, we could assert that a new mechanic must exist. However, there are many games where the same action is mapped to two different buttons to give the player a choice

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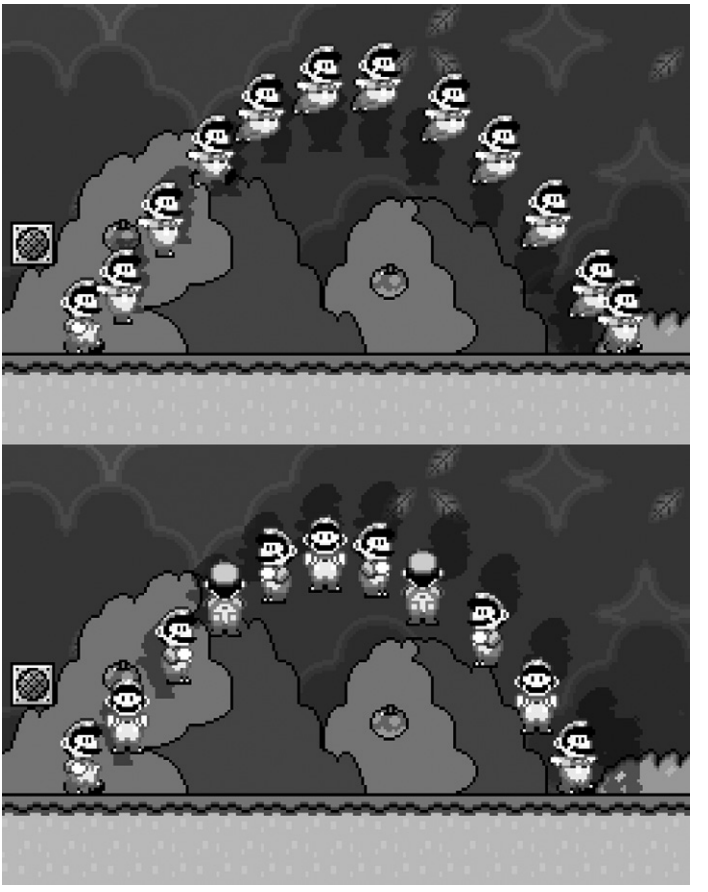

Figure 1.2
Comparison between *Super Mario World*'s normal jump (top) and spin jump (bottom).

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of hand positions, as in *Super Mario World* where the player can press either X or Y to run. Relying on unique buttons would lead to an ambiguous set of signifiers. Animation, variability, and utility of a jump are all similarly ambiguous. By taking a structuralist approach instead, the ludic signifiers are defined by their differences rather than any inherent positive quality—the relation between various elements takes precedence over what is related.[10] In this light, it is not a unique button that tells the player, "This is a new mechanic," but the correlation between two buttons, two Mario animations, two different distances, and two landing effects. These interlocking relations are then connected to a choice about how to use the jump strategically or poetically. Relations of difference structure the choice of strategy, the several components of the ludeme, and its relation to other mechanics.

In practice, things are rarely as clear as the separation between a normal jump and a spin jump. *Super Mario World* includes other jumps that may or may not count as unique mechanics: running and jumping rather than just jumping from a standstill; jumping with the cape power-up; jumping while riding Yoshi; jumping off Yoshi; bouncing off an enemy. To focus on one of these examples, bouncing off an enemy does not seem like a separate mechanic. Most of the time, it feels like an unintended physical consequence of a prior jump. However, if the extra height of that bounce means the difference between success and failure, this feature can become a meaningful choice. The point is that there is no general answer to the question, "What counts as a unique jump?" outside the set of relations established by a particular game.

To see the properties of this ludic language, we can compare it to natural language. In speech and writing, the relation between a signifier and a signified is historically complex but

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also unmotivated and conventional. A word like *mushroom* cannot be arbitrarily or willfully changed, and past precedent exerts a strong force on new derivations. There is no resemblance between the sounds or letterforms of the word *mushroom* and a living mushroom. Video game signs communicate in a more hybrid manner. First, the relationship between signifying act and signified strategy is established through self-conscious planning and design rather than the chance evolution of a linguistic community. As a result, it involves the arbitrary and capricious decisions that any artistic project entails.[11] Second, we can compare the substance of games and language. Just as speech uses sound to convey meaning and writing uses ink, the substance of games is made up of utilitarian acts. Roland Barthes describes some other semiotic systems, such as food and fashion, that simultaneously nourish the gourmand or warm the wearer while symbolizing something about class and culture.[12] In games too, the usefulness of the act is bound up with its meaning. Finally, there is a degree of resemblance or iconicity between the signifier and signified in some ludic signs, such as jumping. Unlike an abstract mechanic like castling in chess, the goal of translating an avatar through space is represented in the act. Such designed, utilitarian, and representational elements color the ludic sign. We can understand their combined effect on the meaning of jumping through the concept of game feel.

Game feel encompasses a set of metrics that designers use to shape the barely conscious tactile and affective experience of interacting with a digital system. Steve Swink describes several of the key elements that make up game feel, such as the resistance and springiness of a button or the range of motion that a joystick affords.[13] He also borrows the terminology of ADSR (attack, decay, sustain, release) envelopes from the analysis of

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musical instruments to characterize the dynamics of player action in the millisecond range. One jump might instantaneously propel the player upward at full velocity, another might take several frames to reach that maximum speed, and a third might not stop accelerating until the player releases the button. Alongside these quantitative metrics, Swink also pays attention to proprioceptive illusions. If, for instance, a train of slime seems to attach my character to the ground before snapping away, this will make the jump feel slower and stickier even when there is no change to the simulated motion. While Swink's approach can be applied to many digital systems, it is particularly useful for describing physical spaces that evoke a rich set of expectations about the real world.

Designers often discuss game feel as either good or bad, with the goal of tweaking these metrics to produce a satisfying or natural sense of control. From a semiotic perspective, however, game feel is better understood as creating nuances within the meaning of an act. Rather than being realistic or not, a designer can imbue a jump with dozens of different physical and emotional qualities: Alucard feels heavy, Mario feels slippery, Mega Man feels sharp, Sonic feels acrobatic. There are literally dozens of variables that a designer can tweak to shift the meaning of a jump, many of which have been outlined by Martin Fasterholdt, Martin Pichlmair, and Christoffer Holmgård.[14] While each of these variables can be individually adjusted, they convey meaning to the player as a structured whole. There are four common and expressive relationships among those variables:

Heft. Jumping is about lifting weight into the air, and the more weight an avatar must lift, the stronger it needs to be. Higher gravity can add a sense of weight to the avatar due to the illusion that heavier objects fall faster. The

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interaction between the strength of gravity and the avatar's propulsive force gives it heft. Beyond these two basic forces, an avatar's maximum fall speed and air friction also help to convey its density.

Consistency. Characters are made of many different things—metal, slime, meat—and jumping can create a sense of interior matter. It does so by breaking the symmetry between the jump's ascent and descent or by creating inconsistencies in those arcs. A character that rapidly ascends before floating down suggests cloth and feather; a character that starts to rise slowly before quickly snapping up suggests a sticky substance pulling against the floor. Consistency also appears during collisions—when the character bounces off a wall or gains momentum on landing.

Grace. Action imparts a sense of life, intention, and agency to an avatar. The avatar wants to jump, but it may not be good at it. The grace or clumsiness of a jump appears as a combination between the slope of the jump arc, its type (linear or quadratic), and the sensitivity of the button during the first few frames of motion. Other features further contribute to the sense of an accomplished intention, such as the time before a player can jump again after landing, and "coyote time" (the time after walking off an edge during which the player is still able to jump, like Wile E. Coyote).

Spryness. Sometimes you cannot look before you leap; you can only react. In contrast to grace, spryness is an avatar's ability to scramble, bend, reverse, and generally overcome surprises. Some of this feeling is directly related to control: how long the player waits for the avatar to move after pressing the button, or how much it can move while in the air. Other aspects of the feeling come from situations that make

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quick reactions necessary. Adjusting an avatar's maximum speed or the amount of momentum that carries over from the ground to the air can add to the franticness and make it feel acrobatic or sluggish.

These four qualities work in concert to construct the overall meaning of a jump and combine to create dozens of experiences. Jumps can be soft, flexible, bubbly, nimble, rusty, willowy, springy, smooth, violent, majestic, catlike, meandering, dense, silly, bony, ethereal, squishy, crystalline, abrupt, frantic, inept, and much more.

In-Between

A jump exists not only in relation to other kinds of jump but to all of the other actions a player can take. When we consider these degrees of difference, we are dealing with what the linguist Ferdinand de Saussure calls the value of a sign—specifically, its associative value, which names the small differences that distinguish it from other signs closest to it in meaning or form. In natural language, any word inaugurates a chain of possible substitutions that start from slight changes and proceed outward: jump → (l)ump → (sl)ump; but also jump → hop → dive. These chains ultimately connect the meaning of each word to the entire system of signs so that an alteration to any one word rebounds on the whole. We have seen how a player distinguishes between two signs, but we now need to build up a larger picture of all the game mechanics. Each game allows a range of actions at any given moment, and surmounting a challenge not only involves picking the right tool for the job but also simultaneously forgoing others. In this sense, jumping is defined by its difference from walking, running, sliding, dashing, climbing, and falling.

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The differential relation is clear in *Super Mario World*. Consider the normal jump and the spin jump again. At first glance, they are quite similar: both traverse a significant amount of the screen, both can land on enemies, and both destroy blocks. By itself, either jump would be enough to win the game. By giving the player a choice between them, however, the designer creates a comparison: the spin jump is shorter but more defensive and destructive. These adjectives cannot be found in any positive traits of the jump in isolation. Moreover, the game designer can manipulate these qualities over time by changing the player's access to other mechanics. Ordinarily, jumping seems like a powerful tool in Mario's repertoire: it allows the player to rise above the earth and surmount challenges. When the player has the cape power-up, however, she gains the ability to fly—rising far higher, skillfully catching the wind to quickly traverse distances, and floating slowly to the ground. In this new configuration, jumping loses its status and looks like a pathetic runner-up, useful only in cramped corners. Meaning emerges in the choice between options. The player gains a sense of the game's closed and differential structure through the practical decisions of play.

Some design patterns common to the genre allow us to outline the general web of meaning surrounding jumping. First, jumping is a way of moving, and it stands out against other kinds of motion. It also interrupts the avatar's action and relates to the time signature of other interrupting actions. Finally, it produces a state—being in midair—from which the player can act in new ways. In all three cases, jumping is characterized by its liminal or in-between position.

First, consider how jumping displaces the avatar through space. Most games include at least one other movement mechanic—walking or running—and the choice to jump

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becomes especially clear when there are multiple options for vertical travel, such as climbing or swimming. Climbing is usually a linear movement confined to a single axis. Swimming or flying operate with two axes of freedom, but they remove gravity as a constraint on that motion. When a game offers these alternate kinds of vertical motion, jumping takes on a curiously hybrid position. It lacks the (literally) straightforward purpose of running or climbing, but it also lacks the freedom of flying. Both climbing and flying are often better solutions to their respective challenges than jumping, but they typically require a power-up or an environmental cue (like a ladder or a vine).[15] In some sense, the purpose of flying is to highlight the half-measures of jumping, as if to say, "The designer could have allowed you this freedom but chose to withhold it." As a result, jumping signifies something between constraint and freedom.

Another dimension for charting mechanics is their temporal character and whether they are continuous or discrete. Movement mechanics are often continuous: the player presses a button and the avatar starts walking; she holds the button and it keeps walking. In contrast, action mechanics are often instantaneous and discrete. Mario shoots a fireball the moment a player presses the fireball button and can immediately perform another action; there is no significant recoil or change of state. Jumping, like shooting, is instantaneous, but it also commits the avatar to a long follow-through. Once the player has started her jump, she cannot turn back. Many players experience a kind of physical sympathy and hold down the jump button until the arc is over, leaning in the direction of motion. The temporality of jumping mediates between the two extremes of punctual time and ongoing time.

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It is positioned between movement mechanics and action mechanics.

As a result of this follow-through, there is a temporal gap between hitting the jump button and returning to the ground. That gap has a further consequence: it allows the player to press other buttons in midair. She can press jump a second time, for instance, and the button might take on a new meaning and effect within the changed context. This change in "entity-state" is one of a few "operational logics" that Noah Wardrip-Fruin describes as grounding a player's ability to reason and interpret game worlds.[16] Many platformers introduce mechanics that are only possible during this hang time: double jumps, ground stomps, or floating slowly to earth. Often the player gains these new abilities while also keeping her old ones. In the air, she can still move left and right, and she can still shoot and dash. Jumping thus becomes a mediating state for new game mechanics. Ordinarily, standing on the ground is the avatar's neutral state, motionless and ready to act on the player's input. However, jumping is capable of absorbing and displacing this neutral state if it affords enough additional powers. The player can begin leaping into the air to simply keep her options open as she moves across the level. Jumping becomes a second nature, coming between the avatar's passivity and the player's choice of action.

In the web of interconnected game mechanics, jumping is a crossroads. It mediates free motion and constraint, punctuality and continuity, and neutrality and action. All of these qualities shift and become nuanced by individual design decisions, but the in-between character of jumping provides a useful starting point for thinking about its differential meaning within the system of mechanics.

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Artificial Gravity

So far, I have been concerned with the semiotic system established within a single game, but players also bring genre expectations about what jumping can, should, and will be. Designers can flout these expectations, but commonly make use of the player's intertextual sensitivity to suggest broader themes and ideas. These are the connotations, as opposed to the direct denotations, of jumping. In semiotics, connotation has a specific meaning—it is when a set of signs, each meaningful in themselves, also signifies another idea. For example, someone speaking Dutch can express "the connotator 'Danish'" in addition to whatever their words mean.[17] As a ludic example, consider that the jumps in each Mario game exist within separate worlds of meaning. It would not make sense to try and use a spin jump to solve a problem in *Super Mario 64* (1997), which has no spin jump.[18] However, the whole range of Mario's jumps—their mechanics and the way the player must choose among them—connotes a general idea of "Mario," so that a savvy player can intuitively grasp what links the 3D version to the 2D one.

As a result of such connotations, jumping takes on another layer of meaning that cannot be located within any one game but ripples across the platforming genre and beyond. Designers can expect their players to know how jumping typically works, what it feels like to perform a jump, and the kinds of challenges and puzzles it can be used for. Genre is another language that players are expected to speak. These connotations are a resource that a game designer can use to provoke recognition, lure a player into a false sense of security, or subtly hide secret objects in unexpected places. A designer can draw on repeated patterns based on the signification of jumping—the

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feel of its mechanics and the problems it regularly solves—to evoke five major themes that crisscross the genre.

First, the upward motion of jumping signifies energy, power, escape from the law, rebellion, and freedom. Gravity is a constant force and an unchanging rule of the simulation, but by jumping, the player pushes against gravity and shows the momentary triumph of the individual avatar. Surmounting obstacles by rising over them is valorized in the genre. The association is so commonplace that it is heroized and gently mocked in *Thomas Was Alone* (2012), with the narrator triumphantly articulating the avatar's goal of transcendence: "There was an outer world, a world beyond the confines of their universe. Up. And to the right." The sense of rebellion against gravity and, by extension, all game rules, can be heightened through situational cues. Some enemies hover or patrol the air and demonstrate that only the player is oppressed by gravity. Other enemies cannot jump and reveal the player's unique freedom. While jumping piggybacks on a widespread metaphorical association between upward motion, progress, happiness, and strength, its positive valence in the game world should not be naturalized.[19] Rather, these associations are actively cued by the challenges that the player surmounts. It is entirely possible, if rare, for games to valorize falling instead and have levels progress downward.

Second, and reciprocally, falling after an initial ascent signifies vulnerability to enemies, helplessness to prevent the fall, and the crushing revenge of the rules. As the player reaches the peak of her jump, gravity reasserts itself. Each subsequent frame narrows the scope of possible actions as the player's increasing speed makes the consequences of any decision harder to judge. Again, there is nothing natural or inevitable about this association. It is established by the regular use of

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pits to kill the player and similar design choices. It is no more difficult to put deadly spikes on the roof than holes in the floor, but games rarely challenge the player to shorten her jump height, and when they do, it is for claustrophobic effect. *Forgotten Anne* (2018) provides an iconic demonstration of this symbolism in a moment where the player blindly heads down a pit, only to be caught in a trap and put on trial (figure 1.3). That descent feels simultaneously like an unfair surprise and

Figure 1.3
A sudden transition from downward platforming to trial in *Forgotten Anne*.

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somehow inevitable. Whenever a platformer wants to convey that the avatar is cornered or that the world imposes its will, it is a good bet that the player just jumped a long way down.

Third, jumping signifies craftiness, turning a bad situation to good account and manipulating fate. If every player must inevitably return to the ground, not all descents are equal. At the tipping point between valorous rising and futile falling is the adjustment of horizontal position while moving in mid-air. Often games reward such skillful manipulation that can bend the arc of the jump ever so slightly back or forward. For instance, it is easiest for Mario to jump over a Koopa, harder to land on it, harder still to land on one side and send its shell sliding, but that difficulty comes with a reward. The emphasis on manipulating an inevitable descent is most visible in games with long, multiscreen fall sequences like the Veni Vidi Vici sequence in *VVVVVV* (2010), Quick Man's stage in *Mega Man 2* (1988), or all of *Downwell* (2015). During these challenges, the player has time to settle into the inevitability of falling and learn the correct skills to adapt her descent without resisting it.

Fourth, the whole jump signifies glee, spontaneity, rhythm, and creativity. Game designers often tune game feel for the inherent fun of action, and jumping has a pleasing pattern that gives the player a sense of agency. Players often hop repeatedly across a level when running would be faster. Designers take advantage of this rhythm by creating levels that are timed perfectly for the player to rush in headlong without stopping. If a game's controls are sensitive or the character has multiple kinds of jump, then the player and character can express individual creativity through minor variations in execution. Mario's signature triple jump, where he rises higher on the third hop and yells "Woo-hoo," embodies all these elements.

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Fifth, jumping signifies exploration and progress.[20] The 2D camera is tied to the avatar's physical position, so that platforming games create a basic equivalence between moving and seeing. Unlike a 3D game where the camera can rotate independently, the player in a 2D game must walk forward to see what lies ahead. Walking, however, is never enough to beat a level by itself. Walls, pits, and platforms impede the player's progress and necessitate jumping. A jump becomes the equivalent of a key in a text-adventure game or clearing a room in a shooter: it allows the player access to new and unseen areas. In addition to straightforward progress, jumping can also reveal elements that would otherwise remain hidden—as when a game hides its secrets in an invisible block.

These five themes are the basic elements that have been repeated and reinforced since the inception of the genre. Knowing how to play a platforming game requires understanding these connotations as much as developing dexterous finger reflexes. At the same time, these themes are not inevitable. Each one arises from a collection of design decisions and habits that have become common through repeated use. As subgenres such as run-and-gun or Metroidvania wax and wane in popularity, or when smaller games push back against such norms, there are shifts to the relative importance of the five themes, new shades of meaning, and new mini-themes. Nevertheless, the weight of the tradition has a powerful force that colors and shapes every jump.

Stunt Doubles

Associations with jumping accrete over the course of our lives. Some come from our embodied experience: perhaps you made

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friends in childhood while playing double-dutch and jumping feels social, or you thrilled at the chaos of leaping into puddles, or you fell embarrassingly into the sand during a high school long jump competition.[21] At other times, jumping is the subject of cultural representation: you watch an action star teeter and leap across a rooftop in a tense chase, marvel at the beauty of ballet dancers floating across a stage, or wonder why Jack would jump over a candlestick while listening to a nursery rhyme. At still other times, jumping is a purely imaginative activity: you dream about the terror of skydiving, or fantasize about dunking a basketball, or feel a mystic affinity for the lazy grasshopper leaping in the summer sun. Players come to a platforming game with a rich context for interpreting jumping.

We might imagine some continuity between how one thinks and feels about jumping in life and games, but platformers actually resist that slippage and impose their own conception of embodiment over the player's imaginative repertoire of jumping. To see why this might occur, we have to examine the nature of translation between semiotic systems. When we conceive of meaning as entangled in a web of relationships, it follows that the same word in two different languages will bear a different range of associative meanings. Ferdinand de Saussure, for instance, remarks that *mutton* in English and *mouton* in French cannot be translated simply because the latter refers to live sheep as well as meat.[22] Structuralism helps to reconceive of translation as an art rather than an act of mere substitution, one that tries but necessarily fails to account for subtle shifts in meaning across languages. The same principle applies to the player's act of translating "jumping" from one semiotic domain to another, but with some additional

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constraints imposed by games in general and this mechanic in particular.

As a relatively straightforward example of such translation, consider how Aladdin's jump in Disney's *Aladdin* (1992) is adapted into a platforming game for the Super Nintendo Entertainment System (1993). In the animated film, Aladdin defines himself through his ability to jump, to be "one jump ahead of the slowpokes" as he sings in an introductory song. This is an apt description of his movement: he combines deft maneuvers with an uncanny awareness of his surroundings, but both are undermined by his continual slipups and missteps. Aladdin moves effortlessly out of danger and clumsily back into it. While adapting the character, the game designers clearly saw the qualities of Aladdin's movement and did an admirable job trying to convey them through smooth animations and acrobatic moves. In a characteristic example, Aladdin swings around a post and the game captures that same maneuver (figure 1.4). In the translation from film to game, however, the pace of his movement changes drastically.

In the film, Aladdin is constantly on the move, and each new shot introduces a new obstacle to his free motion. In contrast, the game asks the player to strategically pause, double back for items, and slowly traverse geography that the film would simply skip over. These changes to Aladdin's pacing all exist to accommodate generic elements of platforming games. Most important, Aladdin's inherent clumsiness disappears in the game because his success or failure is now tied to the player's skill. If the player moves faultlessly through a level, Aladdin appears more masterful than in the film. When the filmic Aladdin makes mistakes, they heap on dramatic complications that he outsmarts, whereas the player gets no chance at suave recovery but only loses a life. The moments where a player is

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Figure 1.4
A still of Aladdin swinging into a jump in the film compared to the game.

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most likely to fail are precisely the places where the cartoon character would never stumble.

At issue is the translation of jumping from one semiotic system to another, but also the dominance of one system over the other. For some media, another image of Aladdin might simply coexist with the animated film; if I watch the live-action remake, for instance, nothing forces me to choose between the two representations of Aladdin. Video games, however, police their conception of pacing through perpetual challenges that test the player's internalization of a specific image. To succeed, the player must adapt to the more cautious movement and accept it as the natural style for Aladdin.

All of this becomes more complicated when we add the player's identification with the avatar back into the picture. It is one thing to hold two competing conceptions of Aladdin in mind, and another to translate one's own bodily habits on-screen only to find them overridden and policed by the game's logic. Moreover, the human body will always be found wanting in relation to the exaggerated motion of game avatars. Often game mechanics tend toward realism or break conclusively with it. Some even fall short: in *Aladdin*, the player can throw apples as a weapon, but they only sail slowly for a few feet before falling to the ground. Many children could throw farther and faster. Jumping in 2D platforming games, by contrast, is only slightly superhuman and differs from our own body in degree. It hovers at the edge of the possible as a dream of what our own body could be like if it were stronger, more precise, less weighty, less exhausting. Christopher Goetz calls this a fantasy of bodily transcendence that brings the ideal of a "body that transcends space" by leaping into conversation the player's "simultaneous bodily training" by the game.[23] When a player tries to translate the idea "I can

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jump . . . in order to" into the language of the game, any valorization of her own bodily capacity has no hope of surviving the transition.

We might even expect some slippage in the other direction. As the player identifies herself with Mario, and the game polices its particular definition of what jumping means, the player's sense of what counts as ordinary movement might shift. The translation back into natural language can leave a skip in the street looking inadequate and discombobulated. The genre promotes a fantasy of shedding the weight and complexity of muscles and fat to take on the specific qualities of an avatar's jump. This is not the traditional complaint that video games foster disembodiment, but rather an observation that games create a split internal to the player's sense of embodiment. On the one hand, 2D platforming games develop a rich sense of physicality with quirks of sensuous feeling and rich histories of meaning. On the other, the rigidity and exaggeration of their structure create a generic antipathy to these same qualities when they are discovered in the player's own body. In its interactions with other semiotic systems, jumping produces an ambivalent fantasy.

* * *

Over the course of this chapter, jumping changes. It starts as the momentary phenomenon of a single arc, then becomes the generalization of a game mechanic, then an abstraction that stands in contrast to other mechanics within a single game, widens to include the generic themes, before finally competing with the player's embodied feelings. These different interpretive horizons point to new qualities visible within jumping: the pragmatic poetry of the arc, game feel, in-between-ness, major themes of the general usage, and bodily self-negation.

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These are visible because jumping exists simultaneously in multiple relations that are structured by difference.

A full account of jumping would not only need to delve into a game's specific choices—how it tweaks variables or frames jumping narratively—but also account for interaction of the semiotic aspects. Each individual arc not only belongs to a signifying mechanic but also connotes a theme. A player's identificatory translation of her jump into the terms of the avatar also depends on the relation of jumping to other mechanics. Slowly floating to the ground characterizes the avatar through its game feel, but it simultaneously quotes the broad themes of falling and inevitability. Rather than exhausting the meaning of jumping, this chapter has only begun to scratch the surface.

Viewed in light of the wider game world, however, jumping conveys a fairly narrow range of ideas that are all centered on the avatar. It tells us what the avatar wants, reveals the quality of its movement, and shows us its capacities. The themes of the genre tend toward an individual heroic avatar struggling against an anonymous and overbearing force. This chapter began with game mechanics because they are the building blocks of meaning and the way that the player accesses everything else within the game. However, we need to look beyond the avatar's hermetic individualism to see how jumping connects to a larger world.

Design Exercises

The following exercises are meant to bridge semiotic theory with the practice of making games. They ask you to explore how jumps can be meaningful, how specific variables can shift the quality of a jump, and how those qualities exist in

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differential relationships. The first prompt is for brainstorming individually or in small groups, while the second two prompts guide you to build a jump. A number of tools allow you to easily experiment with designing a jump, even without coding knowledge. I recommend looking at GBStudio or the Pocket Platformer toolkit on itch.io.

1. Choose a memory of jumping that has left a mark on you. It might be something from childhood, a key moment in a film, the way a favorite animal moves, or anything else that comes to mind. Now try to describe that moment in as much detail as you can: What are its phases? How far does the jumper travel? What parts of the jumper's body are engaged? What kinds of surfaces are involved, and how do they feel? What is the shape of the movement? Is anyone else involved in the jump? What is the purpose of the jump? Now, list adjectives that you would use to describe the whole jump.
2. Choose one of the adjectives you selected during exercise 1. Now, using a simple cube as an avatar, build a jump that expresses that adjective in a tool of your choice. You will want to change many of the variables mentioned in the "Hop, Skip, Jump" section of this chapter. You may also want to create new twists that are specific to your jump mechanic, such as a warm-up phase, a short hover at the top of the jump, or a jolt of forward movement. Once you are happy with it, show it to some friends and ask them to describe the jump with one adjective. Keep adjusting it until your jump communicates the adjective you initially chose.
3. Choose a second adjective from your initial list that is similar to your first adjective and design a second jump for your

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avatar that uses a separate button. Leave the previous jump untouched, but tweak the new jump until the difference between the two adjectives is clear. Save a copy of this character with two jumps. Now repeat the process, but this time choose a third adjective that means the opposite of your original one. Ask different friends to try out all three and have them describe the original jump again. Compare your notes and see how the addition of this mechanic changed the player experience.

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2 Dirt Suspended in the Air

Sitting there, on the first screen of *Super Mario Bros.*, an anomaly taunts the player: a cube composed of ten bricks hovers above the ground without even the pretense that something is supporting it. These bricks are dense and hard: Mario can stand on them, and they break apart with a satisfying crunch when hit. Within the representational world of the game, the block's weight should cause it to drop like, well, a ton of bricks. Yet these magical objects ignore gravity. If you were to ask why *Super Mario Bros*. suspends bricks in the air, a good response would be that the contradiction is exactly the point. Laying out a level requires the freedom to create challenges at arbitrary spatial coordinates, and rather than offering an unconvincing visual metaphor for its mad architectural arrangements, *Super Mario Bros*. simply rejects the limitations of physics. Floating bricks reconcile an opposition between weight and gravity that structures the whole space of the screen.

Mario's bricks are an emblematic example of a platform: any object that an avatar can jump on. Some platforms can be destroyed, others move back and forth, and still others try to attack the player, but they all offer some form of support. If jumping is one way of defining this genre from the perspective

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of player action, the platform is a counterpart that allows the designer to define the space of that movement. Platforms place boundaries, open paths, and provide moments to pause. At once incredibly simple and versatile, platforms introduce tension into 2D space via conundrums like weightless bricks that lend the genre much of its character. There are oppositions built into the fabric of a platform that concern the player's ability to perform jumps, the visual economy of her attention, and the implicit narrative of spatial progression. In the hands of a skilled level designer these paradoxes can turn platforming levels into a subtly expressive medium.

In chapter 1, we were concerned primarily with jumping as a sign and how it signifies. Now we are expanding that context to examine the level design of platforming games, which structure the options a player chooses among. In other words, if mechanics organize how one speaks in a game, levels determine what one can speak about.

Structuralism is known for framing difference in terms of binary oppositions. In this chapter, I will also be following that method to understand 2D space, so it is worth examining the explanations for such binaries. In the first place, and as we saw in chapter 1, structuralism often operates without direct contradictions or contraries through serial differences. For some semioticians, binaries are a methodological contrivance that are useful insofar as they force the analyst to find the simplest recognizable distinctions within endlessly proliferating small variations.[1] Other structuralists are committed to the reality of such binaries as the basic constituents of perception or thought, and they were particularly emboldened in this by cybernetics and information theory from which they directly borrowed the idea of binary signals.[2] A third group,

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led by the anthropologist Claude Lévi-Strauss, was agnostic about whether speech and thought functioned according to binaries, but held that higher-order meanings in cultural production are often organized according to contradictions that cannot be reconciled in lived experience. Myths, Lévi-Strauss writes, exist to "provide a logical model capable of overcoming a contradiction."[3] I borrow something from each explanation. Binaries are a useful starting point for thinking through the sheer complexity of 2D space. The computer makes analog differences more time-consuming and expensive to implement, though not impossible. And as we will see at the end, the contradictions of 2D space can address larger social problems.

In this chapter, I explore five oppositions that organize space within platforming games and set up the major dynamics of player choice: horizontal/vertical, narrow/open, inside/outside, flat/deep, and stationary/scrolling. Each pair can unfold in quite complex ways that divert from a simple opposition to communicate detailed feelings and ideas. At its simplest, a contrast between the horizontal and the vertical can apply to an entire game. *Super Mario Bros*. (1985), for instance, is oriented horizontally as the player travels from left to right, while *Downwell* (2016) orients space vertically by having the player constantly fall. The distinctions can also be charted across time, so that it is the change in height that matters to the player. In both cases, the opposition can take on secondary meanings through the specific ways the player regularly interacts with challenges, so that one axis or pole is differentially associated with a particular set of aims, desires, or strategies. These three aspects—polarization, transformation over time, and secondary symbolization—make the platform a rich symbol.

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The Horizontal and the Vertical

At the heart of the 2D platforming genre is the difference between the horizontal and vertical planes. Gravity pulls down on a player's jump and differentiates the two axes, but jumping is only one way of producing that difference. *Burger Time* (1982) provides another model. An early and genre-defining work developed by Data East and published by Bally Midway, *Burger Time* sees Pepper Pete running across platforms, climbing ladders, evading enemies, and dropping burger parts to the bottom of the screen. Notably, Pepper Pete cannot jump but must run away from enemies and fight them off with a limited amount of pepper. The gameplay of *Burger Time* closely resembles that of *Pac-Man* (1980), another breakout hit published by Bally Midway (figure 2.1). Both games focus on navigating an endless maze, collecting objects, anticipating the movements

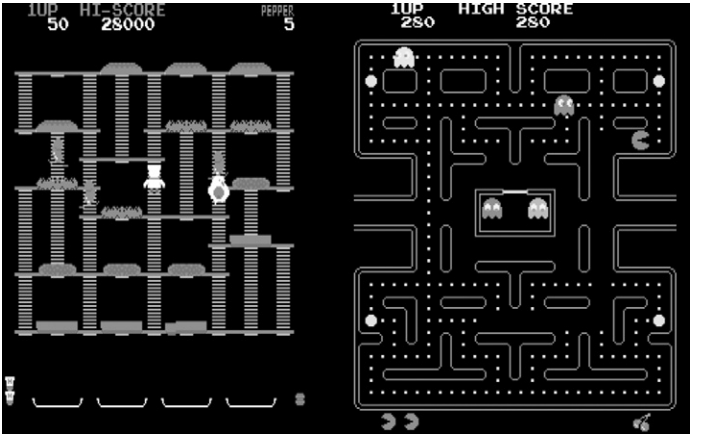

Figure 2.1
A comparison of the first levels in *Burger Time* (left) and *Pac-Man* (right).

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of a computer-controlled enemy, and using a limited number of power-ups to turn the tables on relentless pursuers.

Unlike *Pac-Man*, however, *Burger Time* introduces a strategic difference between the horizontal and vertical axes. In order to complete the level, the player must walk across lettuce, patties, and buns, causing them to fall to the bottom of the screen. If the burger pieces fall on an enemy, that enemy is destroyed. With this simple addition, the game suddenly creates an advantage to being higher up and adds a narrative arc to the space as Pepper Pete works down the screen. There is no simulation of gravity, no special ability that allows vertical movement, only a decision that burger parts should move down rather than float up or slide sideways. *Pac-Man* presents a uniform space, whereas *Burger Time* breaks the symmetry of the horizontal and vertical planes.[4] That small difference transforms the player's experience. When a path in a maze divides above from below, it becomes a platform.

As the burgers in *Burger Time* suggest, the difference between the horizontal and the vertical can be sliced in a dozen ways. Sometimes a platform allows passage in only one direction, or the avatar can aim only laterally, or all the enemies drop from the sky. Whatever directional differences a game invents, it bifurcates the player's sense of space. The horizontal axis becomes a plane of smooth transition and temporal progress, and the vertical axis becomes a measure of tension and intensity.

These dynamics are a powerful tool for a level designer to chart a path for the player. Changes in height over the course of a level can be mapped to a virtual graph of symbolic values that attach to various positions over time, at least insofar as height generates feelings of success or a rising sense of tension. While the vertical axis becomes the measure of

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emotional, spiritual, or worldly highs and lows, the horizontal axis becomes a marker of forward progress and the passage of time. To simulate a paradigmatic plot arc, a level designer would start out with a long, flat area followed by a series of upward jumps, introduce a peak capped by the most difficult challenge, and afterward allow the player a reprieve with a series of jumps in decreasing difficulty that lead back to solid ground.[5] By creating such large patterns across time, a split between horizontal and vertical axes can develop beyond simple duality.

Patterns of up and down can be subtle and complex. In a beautiful close reading of *Inside* (2016), Gareth Damian Martin describes the "falling line of progress," whereby the game subordinates the small victories of surmounting an obstacle to an overall sense of decline and descent.[6] *Inside*, Damian Martin shows, continually tracks downward over the whole game (figure 2.2). In the process, it varies the slope of that decline to distinguish four major episodes, each punctuated by a sharp drop. *Inside*'s

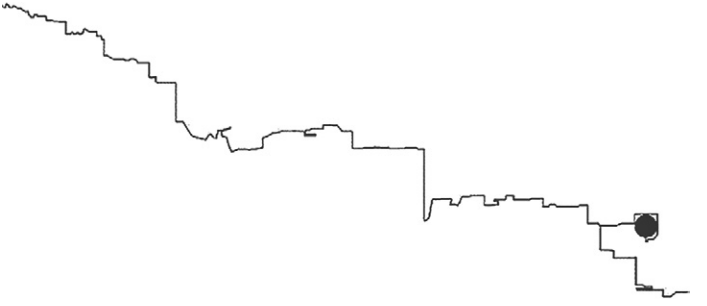

Figure 2.2
Chart of *Inside*'s height over the game. The black circle represents an open and nonlinear space. (Figure by Gareth Damian Martin, reprinted with permission from their "Poetics of Progress.")

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downward structure emphasizes its Dantean underworld and the player's deepening involvement in a nefarious scheme she cannot escape. Height communicates procedurally in *Inside*, even while the visual cues that ordinarily indicate elevation imply that the player remains always at sea level. The horizon impossibly drops to the player's eye level in each progressively lower space, and the disjunct between sight and movement leaves her with an uncanny feeling that the world itself is sinking.

Starting from the premise that a level should spatially reflect a narrative pattern, a designer's choice of possible shapes looks vast. To tell a story about the dark night of the soul, a level might descend slowly or precipitously. To map out a comedy, a level might use small hiccups of height that never develop into dramatic or permanent shifts. To separate out chapters of the story, the designer might organize plateaus where each has a degree of dramatic variation constrained to a given height. Direction, degree, and speed all have an impact on the feeling of narrative transformation. Clambering down a 70 degree slope creates more drama than a gentle hill, but that hill grows more ominous as it extends down for ten, twenty, forty seconds. There are countless small variations to chart.

These Manichean outlines—up is good, down is bad—might seem too simple a tool for mapping the highs and lows of a compelling story. However, there are some factors that mitigate the possibility of cliché. On the one hand, a game always adds its own symbolism on top of the basic good/bad binary. When a player lures an enemy into a deadly falling burger in *Burger Time*, height starts to signify intelligence and cunning. On the other hand, the binary simplicity is essential because it creates a backbone for other design choices to coalesce around. The ups and downs of a level are sensitive

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indicators of dramatic flow: a player will always need to take them into account as she moves. Every slight change in the angle of a hill, every jump far overhead, every gaping pit needs to be carefully negotiated. Up and down thus provide a reliable baseline of player experience. The other binaries that structure a level depend on this immediate engagement and lend color to its black and white framework.

The Narrow and the Open

Figuratively and literally, transformations in height are paralleled by another spatial change to the overall width of a passage. A level designer can place boundaries all around the player's path to control the amount of space she has to work with. The walls, roof, and floor create room that can grow or shrink over time. Because platforms float freely in the air, the level designer can manipulate these boundaries independent of the player's position and through them gains another expressive technique. The flat 2D plane is thus stretched along a second binary that goes from the maximum freedom of open space on all sides to the minimum distance of a tight enclosure that only provides enough room to crawl.

Changes to the narrow/open binary are less sensitive than changes to the horizontal/vertical axis because they start to affect gameplay only in extreme cases. Ordinarily a roof has no direct impact on the player's options because she cannot reach it. Even when the roof is close enough that the player bumps her head against it, she can ignore any changes to its height until she is compelled to jump. Narrowness can thus be divided into four rough categories based on the type of gameplay effect: extremely narrow passages, where the player cannot jump or her movement is otherwise restricted; narrow

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passages, where the player must take space into account when planning her actions; wide passages, where space is plentiful and boundaries need not be considered; and exposed passages, where the lack of any boundary allows other kinds of threats and objects to appear. Tight passages and open edges present different kinds of hazard. Narrowness requires excellent decision-making skills, giving the player less time and space to correct a bad choice. Openness emphasizes vulnerability and the quick reflexes necessary to respond instantly. Both extremes, enclosure and expanse, are dangerous, and the most comfortable spaces fall in the middle.

Even with no direct impact on the player's jump, however, changes to the width of a passage are meaningful. Moving from an open sky to an enclosed cavern signals both the protection of the cave and the possibility that stalagmites might fall from it. If the cavern roof starts to slowly slope downward, it conveys the dread of confinement long before it affects play. A narrow passage or a floor that suddenly gives way to a vast open space allows the player to breathe a sigh of relief at surviving some convoluted stretch of traps but also demands a new vigilance for possible dangers. In narrow passages, the player's eye is trained to one edge of the screen where danger might appear. In expansive environments, she must be on the lookout and scan the entire perimeter.

Because there are fewer degrees of difference between narrow and open spaces, it is possible to map all the basic patterns of change. What this binary loses in degree, however, it gains in the complexity of its symbolism, with each transformation suggesting its own dramatic twist. Allowing that these four degrees can change into one another, we have twelve combinations such as exposed-becomes-narrow or extremely-narrow-becomes-open. However, we also need to add that it matters

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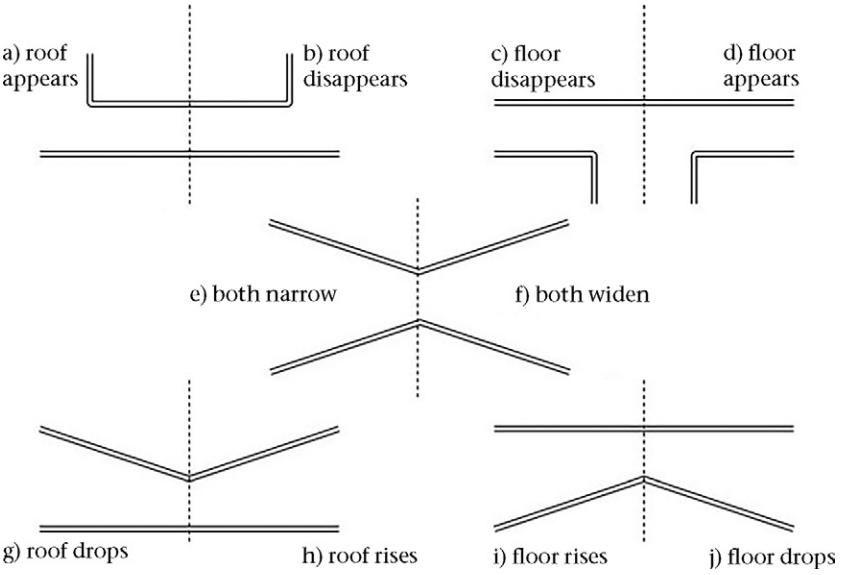

Figure 2.3
Meaningfully different experiences of a level correspond to different types of transformation in the narrowness of a passage over time. The types of change are broadly organized into five binary pairs.

whether the floor or the ceiling is the part of the level that changes, so that we can combine those changes in degree with changes in quality: a roof appears or disappears, a floor appears or disappears, both get narrower, both get more expansive, the floor rises or drops while the roof remains static, and the reverse (figure 2.3). Each of these directional shifts signifies in a slightly different way.

The appearance or disappearance of the roof is one of the clearest signals that a level is changing its tenor and pace. When it appears, a roof limits the player's range of action and makes it coincide with the knowable world. In contrast, its

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disappearance signals exposure—to the sun, to enemies, to sight. When the roof drops away, it invites ideas of exploration and discovery. By contrast, the player is left without a safety net when the floor disappears. There is no corresponding feeling of invitation, only a gaping empty fall that is likely to kill her. At the same time, without a floor, the player must rely on platforms to traverse space, and these allow a free and acrobatic kind of motion to take center stage. There is perhaps no more dramatic illustration of that transition than the ice caves of *Spelunky 2* (2020). After navigating four grueling worlds where each block of movement is an oasis, where booby traps make the player frantically search for an escape, where the rebound of a mistimed shot can fall back in her face, the open chasm of the ice worlds is a cool relief. That feeling quickly fades as the player must throw herself down extreme drops into waiting bombs and onto unstable ice (figure 2.4). When the ground reappears, it brings a sense of stability and safety, but one that makes the avatar feel flat-footed. When the roof or floor appears, it lays emphasis on horizontality, and a boundary's disappearance reorients the player toward verticality.

In addition to appearing and disappearing, the boundaries can get closer together or farther apart. If both sides narrow, the game takes on a foreboding and claustrophobic tone. The logical end of such a reduction in space is an obstruction or confrontation. Constriction on both sides feels intentional and foreshadows something. That feeling can shift, however, depending on how it is framed. If the roof stays steady and the floor rises to meet it, then the effort of climbing lends the passage a sense of reward. A game like *Gris* (2018) allows itself the leisurely pace in which such architectural symbolism can become palpable to the player (figure 2.5). It can also limit

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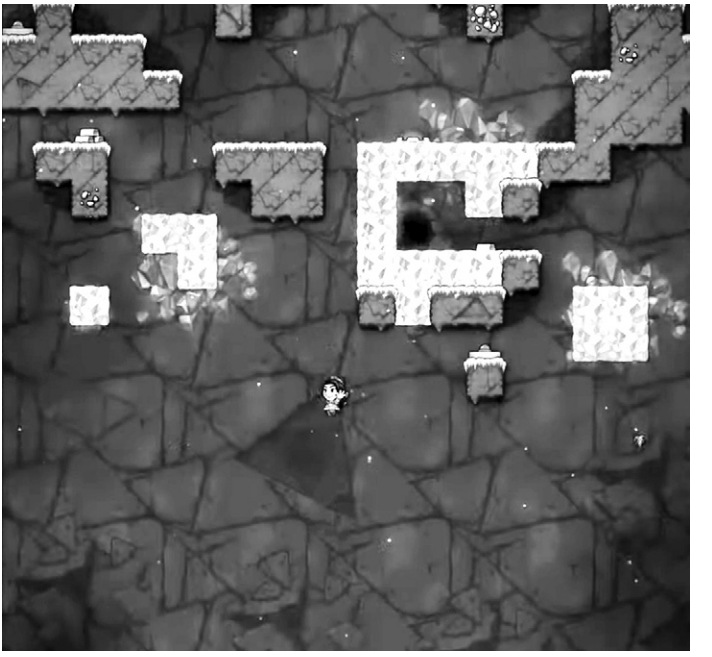

Figure 2.4
A drop between zones of the ice cave level in *Spelunky 2*.

the screen space above the player where new dangers might emerge and create a sense of safety, secrecy, and mystery, like finding a trap door to an attic. When the roof moves down to meet the player, we are in the realm of ambush. The descent is stealthy because it does not alter the player's forward saunter. Rather, it leaves a swath of negative space above her and its weight bears down and threatens surprises.

If, on the other hand, the whole passage widens, that gives the upcoming space the feel of a playground. By widening after a narrow passage, the game brackets any prior challenges

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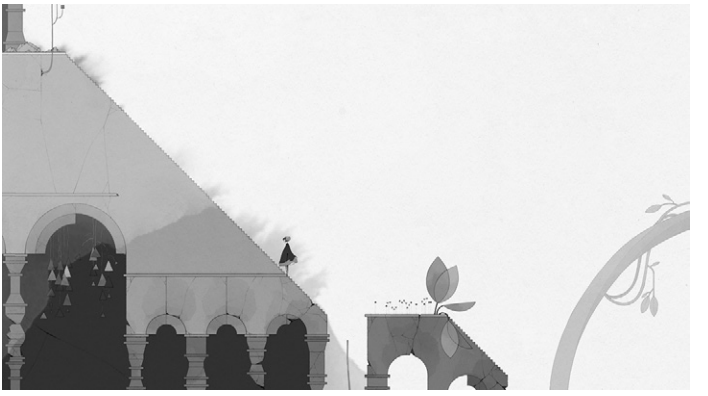

Figure 2.5
An ascent on a broken staircase in *Gris*.

in order to frame a new set of interconnected possibilities. Sometimes the floor drops precipitously when entering a wide zone, which creates a sense of momentum and encourages the player to run ahead optimistically. If, instead, the roof rises away, this suddenly changes the scale of the space relative to the avatar. It can lead to a feeling of the sublime as the player's vision expands past the scope of her ability to act.

All of these changes in width operate around the baseline direction established by the up and down movement of platforming. The rising and falling line of the vertical axis can combine with a level's width to create many compound effects. A confrontation at the end of a descending path suggests a guardian of some deadly secret, while a confrontation at the end of an ascending one is more likely to be a higher power testing the mettle of the player's claims to virtue. Even with only these two binaries, the possible combinations start to multiply.

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The Inside and the Outside

Video game space is non-Euclidean. It stretches in impossible ways, establishes connections between distant points, and loops around on itself.[7] Two-dimensional platforming games have some specific quirks within that strange topology, chiefly the fact that insides have no correlation with outsides. Like *Doctor Who*'s Tardis, a telephone booth that doubles as a spaceship, the interior spaces of 2D platforming games are often bigger on the inside. Consider the starting house of *Owlboy* in the screenshot in figure 2.6. The outside of the cabin looks little more than double the height of Otus the Owl, but inside, the space expands to six times his height. Scalar shifts of this kind allow a level designer to make the house physically interesting in two different contexts. Theoretically, there is no limit to this expansion, and platforming games can hide whole worlds behind an innocuous cupboard door. Unlike the continuity and realism that players expect from a 3D space, the flatness of the 2D screen normalizes the magic of spacious interiors as a genre-specific realism.

Figure 2.6
A comparison of the exterior scale of Otus's house to its interior.

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The contrast I want to draw between inside and outside, however, is not exactly an architectural one. Whether a given space functions as a dwelling or feels like an interior has relatively little to do with the conceptual structure of interiority. Non-Euclidean connections make this point by connecting one exterior to another: pass into a shop door and you might find yourself transported to an isolated mountaintop. Rather than representing interiors, the idea that one space is inside another is based in the organization of entrances and exits. If only one passage leads into a cave and that same passage is the only way back to the larger fortress, then the player experiences the cave as inside the fortress despite the surrounding rock providing the building's foundation. If the player enters a mountain pass from one place in a level and exits it at another point in the same level, the pass feels contained by the level. Even when a player enters a dungeon and never returns to the original field from which she departed, the default conceptual link is to think of the dungeon as within the field. In this way, the player mentally maps a series of connections that give some order to an illogical space.

The movement from inside to outside is abrupt and without intermediate states: there is no liminal moment of play. In this regard, going through a door in a platforming game is like a cinematic cut—it establishes an associative connection between two scenes that otherwise have little to do with one another.[8] Unlike the previous two binaries that continuously change over time, the meaning of this transition is established by the difference between the two sides, which are held in relation and inform one another. In *Super Mario Bros*. the far side of a pipe leads to a sewer full of coins and suggests that a slightly sinister underworld of plumbing always lies just beneath the bright mushroom kingdom. In *Owlboy*, seeing

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the interior dwelling space of each character gives the town of Vellie a sense of habitation and makes its later destruction more tragic. Exterior spaces provide a context for comparison between interiors. In turn, the insides haunt the outsides with a virtual presence, as if every background building the player passes might be explorable or every flat 2D hill might have a dale behind it.

The transition from inside to outside, or outside to inside, while similar to a cinematic cut, also differs in an important way. Although the two sides of a door are unrelated at the level of content, they form a structured pair. A cut does not suggest that the camera will return to the original shot, but a doorway does. If a passage is bidirectional, then the interior is coupled to the exterior as a detour or bonus room. The freedom to go in and out poses the two spaces as distinct ways of viewing a linked world. But if a door only goes one way and the player must find another exit, then the entrance takes on the quality of a forced alternative: either you take the path through the light world or the dark world, through the alleyway or the streets. In both cases, the associative logic creates a sense of anticipated return. If that expectation is thwarted, if the player never returns, then the frame tale remains unresolved and casts a pale light until its memory and influence fade.

Entrances and exits may not have the gradations that we saw in the other binaries, but they allow the level designer to build comparisons and contrasts. Two parallel tracks might play at different rhythms, for instance. Perhaps the player can trudge up a hill into the light or take a passageway into a dark descent and both movements arrive at the same place by way of an impossible fold in space. The binary of the inside and the outside allows the designer to break the continuity of the

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2D plane and create new oppositions between up and down, narrow and wide.

The Flat and the Deep

Another paradox of game space is that nothing really has any depth; everything is a surface. The sprites of a pixel-art platformer might be layered one atop one another, but each layer is flat as paper and without any interiority. A rendering engine paints textures across the faces of a polygon and gives the illusion of depth with bump maps, depth maps, and normal maps that add procedural shading, but none of this detail has any substance. If the player cannot see something, there is no reason to render it.[9] Modeling the rear wall or back porch of a house wastes time, effort, and computational resources when all the player will ever see is the front porch. When Mario jumps up to hit a question-mark block, the sprite that displays a mushroom image is not waiting inside the block but is created for the first time as it appears. Like a postmodern fever dream, the surfaces of games only ever give way to more surfaces.

Two-dimensional platforming games, however, have a unique way of creating an illusory depth that stands in opposition to this logic. Facing the action, the camera often cuts a cross-section out of a deeper 3D space—sometimes literally, often figuratively—to create the plane of action. Like an ant farm, a cutaway film set, or an architectural section diagram, this slice of space reveals all sorts of unused and useless interstitial detail. Between the main passages there are spaces the player cannot traverse—behind the walls, under the floor, through the middle of a platform. And yet these in-between spaces merit visual representation. Sometimes the gaps are

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filled only with darkness. At other times, they are a chance for an artist to detail the soil with bugs and treasure. In every case, they are the subject of a representational choice because there is no default. While such spaces still obey the technical logic of surfaces, aligning the visual cutout with inaccessibility creates a distinctive contrast between a positive space of play and a negative space pulsating with depth.

It is a strange depth to be sure, one that operates according to a slightly bent gestalt of figure and ground. On the one hand, the interior walls and floors are tantalizingly out of reach for the avatar. On the other, these zones feel physically closer to the camera than the plane of action where that avatar moves. That proximity breaks from the game's diegesis with a liminal instruction: "Don't look here." The space is not just a figure that produces the rest of the world as ground but also a frame that marks a transition to the outside world. A game like *Comix Zone* explicitly plays with the reflexivity of this conceit by aligning the bounded space with the frames of comic panels and then allows the character to smash through the boundary (figure 2.7). In platforming games, such black zones do not just border the action space; they are inside it, bisect it, and wander through it. What the black interstice shares with a picture frame, however, is that both exert a force that redirects the viewer's eye.

Another strange contradiction of these black zones is that the depth they represent is rendered in a visual style that is flatter than the flat worlds of sprites and textures. The dirt, roots, and cement that make up the interstice are pushed up against an invisible wall of glass like a cell under a microscope. That visual convention tells us we are seeing the inside of things, even as the rounded and shaded areas of avatar movement code the idea of exteriority. Yet whatever details are

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Figure 2.7
The protagonist of *Comix Zone* (1995) jumping between panels.

rendered in this space are not meant to be looked at. They serve the same function as putting black electrical tape along the bottom of the television, as David Sudnow, a sociologist writing one of the first ethnographies of video games, did to train himself into viewing peripherally. As he writes, "There are lots of ways to look: out of the corner of your eye, in the immediate background, scanning by, just any old where in the periphery, with the quickest glance."[10] Interstitial spaces direct attention back toward the action. Instead of provoking clear recognition, anything rendered in the darkness becomes a texture over which the player's eye bumps and catches as it flees toward the light.[11] The interstice is a visual unconscious for the game, hidden in plain sight but rarely viewed directly.[12] Details signify, rather, by collecting and funneling attention along lines of force and they leave no trace except an uncanny awareness of direction and mood.

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Figure 2.8
A location in *Rainworld*.

Perhaps the most masterful example of the controlled use of negative space as a communicative tool is *Rainworld* (2017). Most of this slow, atmospheric platforming game happens on separate screens that frame the world with generous dollops of darkness. In the screenshot in figure 2.8, all of the action happens in a narrow rectangle that takes up only about one-quarter of the visual field. The player's attention is concentrated here, and that focus serves as a warning that two camouflaged enemies lie in wait. The space is centered and flanked on either side by textured pipes tapering to a triangular point at the screen's edge. These triangles suggest arrows, and the layout has the feel of a midpoint or signpost, pointing equally in either direction. Finally, the main space is in the upper half of the screen, and beneath it lies a textured rectangle of metal plates. Rather than leading elsewhere, this thick negative space suggests that we are at the bottom of a deep well and that moving left or right will also be a movement up.

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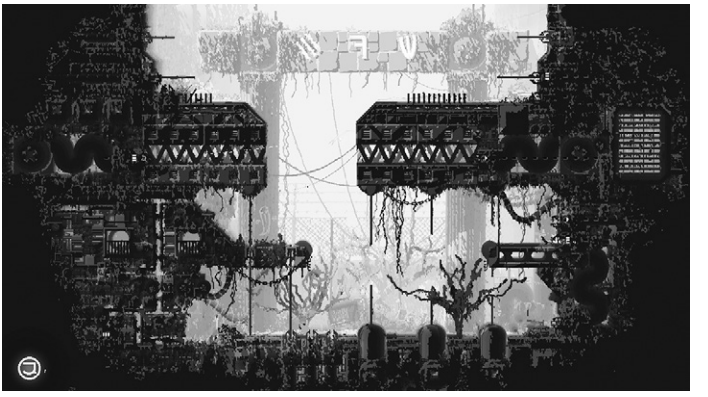

Figure 2.9
A second location in *Rainworld*.

A second location from *Rainworld* (figure 2.9) offers a similar rectangle to navigate but uses the negative space in fundamentally different ways. When the player is in the lower half of the screen, she cannot reach the upper passage and the overall amount of navigable space is comparable to the first screenshot. Yet this space is open and off-kilter; the lower half guides the eye from left to right while the upper half juts from right to left. The left half of the screen is dominated by a maze of pipes and narrow tunnels that invite the player to explore through movement and imagination. The texture on the right side is more chaotic—like a crayon rubbing against stone—except that a rectangular grid suggests something unique and sensical if the player travels in that direction. The play space is layered by the extending platforms. However, the upper tier mimics the maw of the lizard-like enemies the player must constantly evade and conveys the potential of danger and confrontation.

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When platforming games align the space of movement with the space of light and visibility, they create a contrast that directs the player's eye in new ways. These zones of high and low pressure start to signify by creating attentional paths, directions that the player is drawn toward or repulsed from without quite knowing why. Over time, the player will learn to trust or distrust these impulses, connect them to the threat of pits or enemies, to the promise of power-ups and rewards, to paths forward and dead ends. Before these patterns emerge, they are prefigured in the darkness.

The Stationary and the Scrolling

The last contrast I address concerns the camera's movement in relation to a level: whether it encompasses everything on screen or follows the character. Discussing the camera might seem a little out of place in a chapter about 2D space, but the camera in a platforming game is best thought of as a component of space rather than an eye looking out upon it. The 2D camera constructs the space it views. A cinematic camera also constructs space—for instance, by stitching together shots from different locations into a seamless environment. In a 2D platforming game, however, the camera is part of space in a causal sense. The camera's movement, boundaries, and focus can directly alter the space of play, which makes it impossible to discuss its simpler operations apart from the organization of level design and player action.[13]

I will demonstrate the strangeness of the 2D platforming game's camera with a few examples that build in complexity. First, the camera can be active as a boundary. The edge of the screen is not only a visual boundary but can block the avatar's path, obstinately refusing to follow her leftward. If a player

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jumps off a ledge, it is the camera's decision to move or remain still that determines the player's safety or death. Its ability to kill the avatar is independent of any objects in the world such as lava or spikes; it might track the player upward but refuse to return to a platform she visited moments before, rendering it deadly. Equally, the camera has creative power over objects in the world—such as dead enemies restored to life off-screen. The camera remembers the player's violence for as long as it continues to look, but then becomes a force for endless forgetfulness and reanimation.

Though tethered to the avatar, the camera also has degrees of autonomy. Sometimes it has weight or inertia and the avatar must push it by walking near the edge of the screen before it starts to move. Sometimes the camera tracks forward beyond the avatar's position to anticipate where momentum will carry it. And sometimes the camera takes control of the environment entirely. In autoscrolling levels, the camera sets the pace of movement independently of the avatar, cutting a path of its own design through a level. If the player tries to stand still, the camera will push her slowly forward and crush her against an obstacle. If she tries to run past the edge of the screen, the camera will force her to walk forward at its designated pace. Sometimes this effect is naturalized by transforming the camera edge into a roaring wall of flame or mechanical buzz-saws chasing the player, but ultimately it is the camera imposing its own sense of time on the game's movement.

Finally, consider the more dramatic intervention of the camera in a game like *Where Is My Heart?* (2011). Here, the concept of "camera" is disarticulated from the overall screen space by multiplying the number of viewports that render a single level and then rearranging them to disorient the player (figure 2.10). Simple and straightforward challenges become

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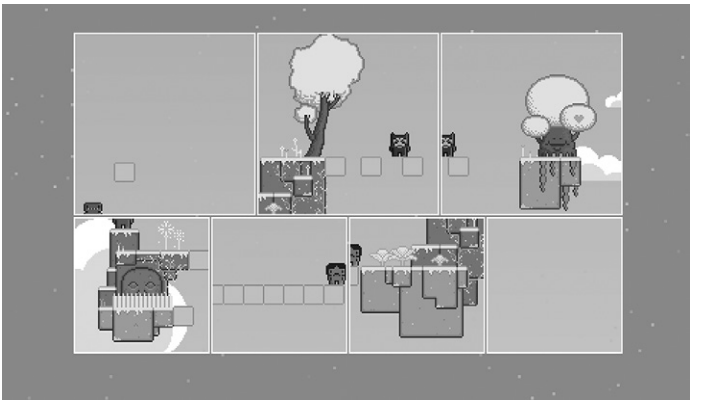

Figure 2.10
Multiple cameras that can be rotated in *Where Is My Heart?* (2011).

confusing when you step through the left side of one window and see the bottom half of your body emerge to the right. These cameras also become an active force in the game. The player eventually gains the ability to rotate the viewports while the avatar hovers above and outside her movement. What is at first a merely visual distortion becomes a spatial one, with the cameras reorganizing fragmented views into a puzzle. *Where Is My Heart?* is something of an anomaly—though by no means alone—in turning camera movement into a mechanic, but it demonstrates the nascent possibilities that many 2D platforming games draw on in more subtle ways.

The point of this digression on the agency of the 2D camera is to complicate a simple distinction between stationary cameras and those that follow the avatar. It is tempting to say that the difference between the two is only a matter of camera movement and does not concern the level itself. The previous paragraphs are meant to render such a distinction untenable.

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A stationary camera and a scrolling one produce two fundamentally different spaces. For the static camera, borders mark transitions—walk to the edge of the screen and your avatar teleports to a new level. That camera-defined space becomes a unit of gameplay. Only the enemies on screen can harm the player, puzzles can be solved with the materials at hand, and the larger game can be mapped into the regular units of screen height and width. In contrast, a scrolling camera treats space as an emergent phenomenon that can change around the player. In Terra Lauterbach's *suteF*, for instance, one puzzle involves the player starting down a long hall and deciding to turn back midway, only to discover that a new passage has opened where none existed before. A moving camera is more agential, able to revise the shape of the world on the fly.

The designer's choice between these two kinds of camera recasts every element of level design that I have noted to this point. The scrolling camera stays with the character. It frames the ups and downs of space as her unique story. It individualizes space. By following along beside the player, the camera causes the world to blur while the avatar stays in focus. This highlights the broad and expressive gestures of the character and the quality of its animation. When following a character, the 2D camera is positioned far enough away to miss any subtle facial emotions but at a perfect distance for melodramatic gestures. By approaching the character from the side, the silhouette of running and jumping can show off their most varied shapes. By focalizing the personality and feelings of the character, the camera ends up associating those qualities with moments in the unfolding level. Similarly, the scrolling camera offers a specific set of pleasures around its unfolding edge. As the player reveals new parts of a level's space, she is led to feelings of anticipation at what might appear, surprise at

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what does, fright at its rapid approach, relief at how the avatar surmounts the challenge, or laughter at the slapstick nature of the whole endeavor. The ups and downs, narrowings and widenings, ins and outs, surfaces and depths of a level are all inflected by this structure of feeling.

A static camera, by contrast, centers the architectural elements of space. Here the camera is uninterested in the avatar's movements and instead frames the level as a timeless place upon which many characters have jumped and where many more will jump in the future. Because the player can see the whole level at once, she can picture and contrast multiple paths through the space before she chooses one, which renders her actions a little bit virtual. Visualizing the whole space at once also typically means zooming out, deemphasizing the qualities of the avatar, and rendering everything in a more stationary and omniscient light.

There are, of course, degrees and compromises between the purely static camera and one that follows the character. However, these changes are not as flexible as the naive idea of a camera might suggest. One of these magnetic poles exerts a powerful force on how the player experiences the overall meaning of a space and the story a level tells. Without overwriting the up-and-down drama of the vertical line, the camera can alter the subject matter; without erasing the pressure of narrowing and widening passages, it can reframe the player's knowledge of upcoming events with ironic distance; without collapsing the inside and the outside, it can paint points of connection as more or less structured; without turning the player's attention away from the central action, it can give more or less time to dwell within a canvas of negative space.

* * *

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At the outset, I suggested three ways of reading binary oppositions: as a methodological expedient, as the result of the computer's affordance for digital results, and as the reflection on lived contradictions. The first two have been present throughout, but it is perhaps time to survey the oppositions, reframe them as contradictions, and ask what is at stake here.

We can restate the underlying tensions as follows. The first opposition is between the undifferentiated and smooth movement along the horizontal axis and a stratified and evaluative movement on the vertical. The second opposition is between the spontaneity and movement of open passages and the constraint of narrow passages. The third is between the autonomy of any space to determine its own ratios, organization, and borders and the hierarchical subordination of that space to its container. The fourth is a tension between the agency of acting within the available space of play and the force exerted by the interstices that unconsciously shapes and controls that play. The fifth is an opposition between the individual experience and the indifference of a social order. Stated in these terms, the oppositions share a set of common concerns around freedom and control.[14]

On the one hand, that opposition should not be surprising because it echoes the contrast between the player's actions as one source of meaning and the game designer's architecture as another. On the other hand, the specific valences of each contradiction point beyond that relationship. They evince a concern with freedom premised on equivalence, management of risk, privacy, self-possession, and individuality. The player's freedom is opposed by a sense of control that promises a position above others and constrains the natural abilities of the avatar. That freedom is haunted by the possibility of capture within a larger organization, paranoia about secret mind

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control, and an uncaring world. I am framing these tendencies in their most extreme form, but these are the contradictions that shape the player's acts. Together they paint an ambivalent picture of the platforming genre as engaged with the categories personhood and society that have taken shape in the last few decades under neoliberalism and postmodernity. The spatial logic of the genre allows it to strip relationships of their social character and frame the avatar as an isolated agent in a hostile world. When it does reintroduce relationships, it is through the violence directed toward enemies.

Design Exercises

The following exercises are meant to bridge the theory of the previous chapter with the practice of level design. They show how to take an existing narrative and transform it into a blueprint according to the first three contrasts: horizontal/vertical, narrow/wide, and inside/outside. All of these exercises work best in larger groups where you can share and discuss your choices.

1. Choose a short story. Any will do, but I like to start with very short works by Franz Kafka or Lydia Davis. After reading the story, you will go back and map it. Start by deciding what is worth charting: Is it the emotional highs and lows of a character? Their objective success or wealth? The building tension of a narrative? The collective fate of a group? Then decide how you will map the story to the axes of a graph. Are you mapping the objective time of the story, the order in which the events are narrated, or the amount of page space they take up? Now go back through the story and make a chart of its progress.

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2. Read through the story a second time and make a note of how much freedom is available to the character or group you are tracking. That could mean how many options are presented by the story, how free the character feels, or how much power they have to act compared to other people in the story. Assign a number from one to ten at each point. Add a second line that follows the first one on your diagram, but that tracks freedom by giving more and less room above that line.
3. Go back a third time and look for any details or events that fall outside the main story. Make a note of where they occur and whether they show up again later, then find something that makes them feel separate from the story. Now go back to your diagram. Draw an arrow to a new area outside the main diagram anywhere you listed an event or detail. If it shows up again, draw an arrow pointing back into your diagram and connect the two outside points. For each of these outside areas, write a word or two about how they should feel.
4. You now have the blueprint for a map. Use it to build a level for your own game or use a level design tool like *Super Mario Maker 2* (2019). Discuss what elements of the story survive the translation and which do not.

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3 Philosophy of the Enemy

Consider the lowly Met (figure 3.1), a hard-working robot that appears in virtually every *Mega Man* game and comes in many flavors. Some patrol, some fly, some pirouette before shooting a bullet in Mega Man's direction. What distinguishes the Met from other *Mega Man* enemies is that it hides until the player gets close. While it waits beneath its hard hat, the Met is indestructible, like a clam or limpet clinging to the ground, and the player must risk close combat to defeat it. Level designers use the Met to interrupt the player's rhythm and vary the challenges she faces. However, an actual encounter between the player and a Met exceeds that utilitarian purpose and gives rise to a feeling of animacy.[1] The player sees the Met hiding and knows that it fears for its life. She also recognizes the Met's strategy and knows that it is intelligently avoiding Mega Man's blaster. The player is surprised when the Met finally exposes itself to danger and she discovers its commitment to a cause. While playing *Mega Man*, a player meets a pixelated creature strangely imbued with life even as she tries to destroy it.

For the game designer, the strange magic of an enemy's alien presence is always mediated by its abstract effects on gameplay. The designer sees the computational anatomy of

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Figure 3.1
Mega Man attacking a Metall C-15, or Met, in *Mega Man X* (1993).

the enemy in its animated kinematic skeleton, state-change variables, and collision boundaries. Even while designing for the player's experience, these technical elements constantly break the illusion of life.[2] Platforming games are particularly liable to flatten liveliness into function, because the most common theories of 2D enemy design involve sifting through tables of possible movements, sizes, and special abilities and recombining these traits into some fresh mishmash.[3] That analytic perspective is crucial for building complex challenges, but when the Met becomes a list of separate qualities—an immobile enemy that shoots and has an invulnerable state—the experience of its otherness evaporates. The life of enemies is an illusion, but that illusion is the foundation for an experience of a jointly shared world.

Why should such a power be vested in enemies rather than another game element? As chapter 1 argues, action on a 2D

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plane is the language of platformers. Movement, force, and violence become signs that an object exists in the same world with the player. Of all the objects that exist in game space, enemies occupy it in a uniquely reciprocal fashion. Enemies can touch the player, and she can collide with them. Enemies can hurt the player, and she can destroy them. The player is passive in the same way an enemy is passive and active in the same way it is active. All of these mirrorings differentiate enemies from the brute environment, from coins and switches, from friendly characters and the user interface. The floor and walls, for example, stop the player and exert force on her but cannot be influenced. Without a full simulation of Newtonian physics, a level's boundaries lack the equal and opposite reaction of inertia and become simply inert. A nonplayer character like Dr. Light speaks to Mega Man, but the player can never respond in kind. Other characters might sell an item or save the game, but the player rarely reciprocates these interactions. Even as bodies in space, these friendly characters exist on another plane and do not impede or touch the player. Rather than offering an obstacle, the avatar simply passes through them as if they were ghosts. The platformer's generic emphasis on movement thus makes physical force into a medium of communication and exchange. The violent confrontations between player and enemy are an outgrowth of that framing. However we understand the meaning of violence, it demonstrates a prior communion through shared vulnerability.[4]

Game mechanics are a language that the player learns to speak, but without enemies, the player is stuck in a monologue of movement and survival. Through the reciprocal relations of speed and force, enemies become interlocutors in a conversation with the player where combat expresses a conflict over the proper uses of space.[5] Some enemies share the

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player's vocabulary and grammar of movement but are guided by an entirely different worldview. They walk endlessly back and forth across a platform or hold fast to a single position within a level. Other enemies introduce new mechanics into the language of motion by flying where Mega Man must walk or attacking with unprecedented speed. In individual encounters, the player learns about the possible differences and variations that the game's space allows. At the same time, fighting through hordes of robots reveals how these individual encounters belong within a complex system.

We previously considered how individual action signs such as jumping belong within a system of mechanics and that other verbs also shape the meaning of a jump. However, we did not examine the nature of that systematicity itself, and it is a crucial concept for structuralism. For thinkers like Ferdinand de Saussure, there is a fundamental difference between speech and language. Speech encompasses all the things we actually say to one another; it exists as factual and empirical and is materially embodied in sound waves or ink on a page.[6] Language, by contrast, is always an abstract and ideal system, with rules for proper grammar and pronunciation and conventions about what words mean. This abstraction is not created by linguists (or semioticians), but rediscovered by every speaker as the basis of communication. Enemies in platforming games form such an ideal system, one that lets us imagine they are thinking, feeling, caring beings and one that each player must create in the process of play.

When encountering an enemy, the player picks up dozens of subtle cues even if she never articulates them. She catalogs the nature and variety of things that exist in the game, which allows her to quickly identify them as friend or foe, obstacle or aid. She learns the strategies enemies might employ and

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how they think, allowing her to surmise what will pursue her or run away. She discovers that enemies can be useful, forcing her to plan and allocate time and resources. She finds them resisting her efforts in unique ways that reveal a goal and motive behind their actions. Such small theories help to impose order and organize the abundance of enemies into a system. Each theory about what an enemy is, each guess about what it wants, each anticipation of how it will defend itself, builds on a background of previous interpretations and experiences. Enemies provide a window onto how systematicity structures the ludic language, and the specifics of that organization tell us about a game's central themes.[7] If we take enemies seriously, they reveal the philosophical commitments underpinning a platformer.

The Ontology of Hazards

Ontology is the branch of philosophy that investigates what it means to be or exist, the ways things exist, and the variety of things that exist. It offers a way of thinking about the most fundamental aspects of our universe, things that must exist for the world to appear the way it does. In computer science, ontology takes on an additional applied sense because the modes of existence for computational objects are defined programmatically.[8] In video games, these new computational ontologies can defy very basic assumptions. As we saw in chapter 2, video game spaces can loop in on themselves, connecting in ways that would be impossible in ordinary experience. They can give us unprecedented control over time, such as *Braid*'s (2008) rewind mechanics. They regularly challenge our sense of causality and relation, even making the process of guessing and learning new categories part of the fun.

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Games have this radical plasticity to redefine their worlds because they treat ontology as a system. We never see the meaning of existence directly in an object, but rather grasp its persistence as we carry it around, or see it age, or bump it against something else. The large and abstract categories that make up ontology emerge directly from the ways that experience is consistently structured. If they were to be systematically arranged otherwise, then our categories would differ. The structuralist linguist Émile Benveniste went so far as to argue that the categories of Western metaphysics are only the accidental result of German grammar.[9] The power to generate computational ontologies thus does not rest directly with code, but rather the systematic way in which that code orchestrates player experiences. In this sense, video games are similar to novels or films, which establish their worlds by maintaining consistent rules across an entire work. In both cases, it is the systematicity that forces a reconsideration of what reality means. The nature of a game world is thus up for grabs, and learning to play means looking around and taking stock of what exists within it.

In the previous chapters, we have seen two kinds of beings that shape the ontology of platforming games: the avatar and the platform. We could add many others to this list: collectibles, power-ups, checkpoints, non-player characters, doorways, particle effects, vehicles, weapons, and more. All of these things are of interest for an ontology of game objects, but they do not fundamentally alter a basic but systematic division between the avatar and the platform. The avatar is a moving, thinking, responsive, active, independent, complex, changing kind of being while other objects have only traces of these qualities.

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Even the simplest hazards, however—spikes hanging from the roof, a falling rock—interrupt the clear split between avatar and world. Hazards are no more complex than other game objects, but they refuse to be a simple resource for the player. A hazard not only damages or kills the avatar, but in the process reveals its vulnerability. The binary contrast between an active avatar and a passive world is muddied when the player must look out for danger. Hazards are a starting point for an ontology of game worlds not because they are inherently interesting but because they are the simplest form of a powerful relational dynamic. Once that relation is established, we can identify enemies that appropriate every aspect of the avatar's uniqueness. An unmoving, unthinking, invulnerable spike on the ground leads by steps toward a moving buzz saw, a reactive enemy that turns around when it bumps into something, and a proactive and intelligent enemy that seeks out the player. With each encounter, the player must redraw her conceptual map in progressively more complex ways, but the fundamental challenge to the passive/active binary is already there in a bubbling pool of lava.

How does this ontology look in *Mega Man X* (1993)? To start from the simplest enemies, a group of cannons fire at fixed intervals and seem oblivious to the player.[10] For a world filled with robots, these are the most robotic beings the player encounters—and they are surprisingly rare. A step up in complexity introduces two more prolific categories of enemies: the first type runs, flies, or swims directly at the player and slams into her. The second group is stationary and uses ranged attacks.[11] Call these dashers and shooters. Dashers are fast moving but follow predictable paths, and they attack in swarms that overwhelm the player, but each individual can

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Figure 3.2
The Batton, the Amenhopper, and Sea Attacker (from left to right) are robotic animals that belong to the dasher category.

be destroyed with a single shot. Visually they are represented as robot-animal hybrids (figure 3.2). Shooters, in contrast, are typically larger and block the player's path with their bulk; they can take more damage and choose at random between two attack patterns. These robots tend to look more humanoid. In addition, a few specialized enemies have an instinct for self-preservation, like the Met, or pilot vehicles.

Rarer than these enemies are mini-bosses and bosses. Mini-bosses are tougher and larger, and they imprison the player in a battle arena. Still, they follow the same basic division between dashers and shooters. The worm-like Utuboros wanders back and forth around the player to inflict damage with its body but never shoots, while a combination helicopter and bee named Bee-Blader fires multiple weapons but moves toward the player only at an excruciating crawl. The mini-bosses are simply more dangerous versions of enemy types the player has already seen. Surprisingly, this also includes Sigma, the final boss of the game. Sigma has two forms that the player must fight sequentially, and the two stages repeat the mini-boss division, with the first emphasizing quick motion and the second stationary firepower. Only the eight maverick reploids, a term the game invents to distinguish these boss robots, synthesize the two types and force the player to integrate the separate

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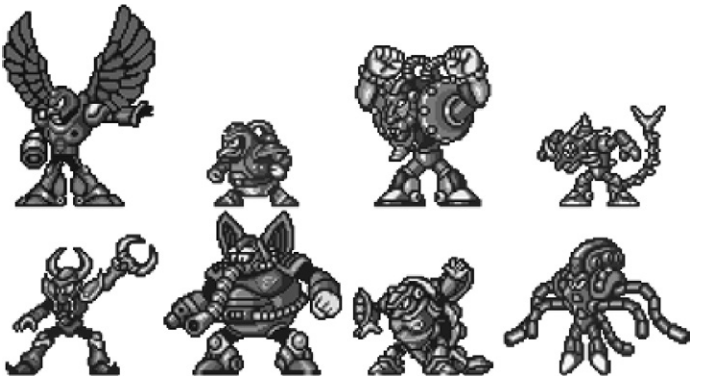

Figure 3.3
The eight anthropomorphic reploid bosses of *Mega Man X*.

combat skills required to defeat static and mobile attacks. It is fitting that these reploids are all anthropomorphic animals (figure 3.3). They have recognizable attack and movement patterns and are thus a little more robotic than Mega Man, but they are the closest to sentient peers.

This typology reveals how the beings of *Mega Man X* are organized into an ontology that generates novel distinctions (cannons/dashers/shooters) through systematized differences. The game operates in a dualist universe where mind is opposed to body, a theme that suits its science fiction story of machines gaining sentience. Dashers are pure body—they operate on instinct and can only throw themselves in Mega Man's path. Shooters have the stirrings of mind—their bodies are passive, but they can act at a distance and have the power to choose between attacks. Interestingly, enemies associated with the mind are also physically massive—suggesting an evolutionary path toward the more difficult bosses. The split between types is partly a heuristic to orient the player in the

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midst of fast-paced battles, but it also becomes her guide to the basic framework and imaginative limits of the game world.

Epistemology of Emergent Behavior

Epistemology is the branch of philosophy that asks how we know the world and how we can be assured of that knowledge. A traditional problem of epistemology is how we come to know that other people have minds like our own and, relatedly, whether animals and machines are conscious.[12] The question arises because we never have direct access to the thoughts of another person, but only a series of encounters and interactions from which we make an explanatory leap. That same assumption easily creeps into the experience that some enemies are smarter than others or that they make strategic choices. The player imputes a different kind of mind to bosses than cannons. Nor does the player stop with intelligence, but can easily find desires, motivations, feelings, and beliefs lurking within enemy behavior. More complex games might simulate such things programmatically, but the enemies of *Mega Man X* follow simple instructions. As coded, nothing in *Mega Man X* is intelligent. Yet these abstract patterns of movement on a screen coalesce into the feeling that we are dealing with another mind.

When we talk about a structuralist system like language as ideal and abstract compared to everyday speech, it involves the same leap. Systems are not deductions that can be surmised from individual examples, or even inductive patterns, but require what the semiotician Charles Sanders Peirce called abduction: making a leap beyond what is given to generate hypotheses.[13] To survive their encounter, a player needs to generate a theory about how an enemy will act. The more

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coherent and interconnected the guess, the more useful it will be. These abductive theories differ from deductions because they rely on repetition to spot consistencies in need of explanation, but they also add something original to that pattern. Only across multiple repetitive encounters do enemies start to feel alive as the player is drawn to impute more agency to understand their actions. A structural system explains our experiences while it evolves within those experiences.

In *Mega Man X*, an enemy's ontological type is little help in anticipating its thoughts. Consider three examples from the animal robots we saw earlier: the Batton, the Amenhopper, and the Sea Attacker (figure 3.2). The Batton is a bat-like creature that waits on the roof until Mega Man gets near, then flies in a line toward him. If the Batton hits its target, it quickly flies back up to the roof and repeats the process. It clearly has a goal and knows when it accomplishes that goal. The Amenhopper is more akin to a water strider; it is a bug that skates along the surface of liquids in quick bursts or hops along the land. The Amenhopper moves toward Mega Man but regularly interrupts itself with a lengthy pause; it seems drawn to the player but without any urgency or purpose. The Sea Attacker is a seahorse that hides beneath the sand, shoots straight up as the player gets close, and then dashes toward her and off the screen. Its speed followed by a momentary pause suggests surprise. The Sea Attacker is dangerous because it rushes at Mega Man, but it also rushes past him in a desire to flee. While these enemies form an ontological class, we attribute very different mental states to them.

The same analysis can be applied to shooter enemies in order to make sense of the intuition that they are more intelligent. Gun Volt is one of the first enemies Mega Man encounters, and it has a simple pattern: it either shoots two quick

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Figure 3.4
The animation frames for the Gun Volt, showing it crouch and think before firing.

electric balls along the ground or fires two missiles in a straight line through the air. The choice is a random one and without much practical impact on Mega Man's response, but Gun Volt pauses with closed eyes and seems to think before each attack. Mechanically, this has the effect of warning the player of the impending attack, but visually it suggests a moment of reflection about the best course of action (figure 3.4).[14] That moment of seeming choice is particularly interesting because it only becomes clear after the player has fought several Gun Volts.

To understand a Gun Volt, we need to examine the way the player generally encounters it as part of a system. First, its health is calibrated so that even if Mega Man approaches with a charged blaster, the Gun Volt will have enough time to fire off one of its two attacks. In the most common scenario, the player will not see both attacks this enemy can perform—and even if they do, they will not know that two is the whole scope of its arsenal. The player gets to know the individual Gun Volt only through the larger set of Gun Volts that collectively demonstrate all its potential attacks. The player's experience of the enemy's intelligence, then, is distributed across multiple scenes. When she encounters another Gun Volt, this new example of the previous enemy seems to consider the

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environment while it selects an attack—to test whether a crate or the height of the roof might make it harder to dodge missiles or electricity. When it considers a second time, it seems to judge the effectiveness of its original choice and initiate a psychological game of rock-paper-scissors with the player. The result is really a computational coin toss, but across the encounters, the player accumulates a sense that the enemy is strategizing. The same thing can be said about enemies in general: when the player discovers a new enemy, her first reaction is to shoot it because *Mega Man X* teaches her that every enemy is out for blood. The enemies in other platforming games sometimes allow the player to simply walk past, but *Mega Man X* reveals a systematic antagonism that forces the player into confrontations.

The repetition of these encounters also makes possible subtle differences. The eight maverick bosses, for instance, all confront Mega Man in an inner sanctum with nowhere to escape. The situation creates an inevitable kill-or-be-killed logic. Within this framework, however, each boss displays emotional nuance. Storm Eagle tries to keep Mega Man at a distance by blowing him to the side of the stage or swooping down from off-screen. It comes off as aloof and somewhat frightened of the fight. Spark Mandrill wants to get close to the player, throwing itself across the room to control the horizontal space, and swinging along the roof to limit the player's vertical motion. It seems more personally enraged and wild. Flame Mammoth alternates between jumping across the stage with an earth-shaking weight and flipping a conveyer belt switch in order to slowly travel back-and-forth. It gives off a feeling of indifference and assuredness in the player's eventual demise. These are all singular encounters, but they take place against the emotional backdrop of all the prior fights, and that

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system of relationships allows the minor variations between bosses to imply personality.

This second system of intentions and emotions builds on and extends the modes of existence within a game. It is easy to drift here, to spin out speculation about what might be motivating the aggression of a monster or the resolve of a foe.

Economics of Destruction

Economics is the realm in which we establish the value of things through exchange, and the philosophy of economics deals with the nature of value, rational choice, and the kinds of objects that count as exchangeable. An economy produces a system of general equivalence between things based on what we are willing to do to obtain them. Some video game economies consist of buying objects with real currency, others offer virtual markets of simulated goods and coin, and still others are founded on a broader exchange of the player's time and energy.[15] Platforming games exchange enemy life for many kinds of reward—health, gold, experience, collectibles—but most commonly a player kills an enemy in exchange for spatial progress toward a goal. The specifics of that trade vary, but an economy founded on enemy destruction is a pillar of how platforming games communicate the worth and meaning of their worlds. *Mega Man X* involves three main rewards for destroying enemies that each feed into its larger economy and construction of value: immediate progress, health and ammunition, and upgraded abilities. Every enemy is involved in one or more of these trades.

Game economics can help us better understand the relational dynamics of systems, where forms of partial equivalence, exchange, and valuation shift the meaning of terms.

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Ferdinand de Saussure demonstrates this with the fact that the English words *sheep* and *mutton* are represented by a single word in French.[16] Translating between the two languages shows something about the conceptual systems underpinning them—revealing a tension in English between live animals and food. Game economies create a similar tension and leakage by bringing seemingly disparate game elements into connection. The player accords a certain value and meaning to health and ammunition—they are salvation in the nick of time or an injection of strength. Because items are connected by a system of exchange, those same ideas attach to the enemies, if only in the negative. Conversely, a health item simply sitting in the level inherits a little spark of danger and risk because it is so often part of encountering enemies.

The most fundamental exchange is trading an enemy life for a few feet of forward movement. *Mega Man X* makes it difficult to simply bypass an enemy, as they either block the way or follow the player and make future challenges more dangerous. Every step forward is bought with a hard-won victory. It might even be possible to calculate exactly how many square units of space an enemy life is worth. At the low end of that scale would be all the enemies that reappear if the player leaves the hostile area and then returns. Even a momentary step backward can cause some enemies to respawn, so that the player does not buy passage so much as pay a toll. Other enemies do not reset after being destroyed: killing them frees up space to pause and regroup. With these enemies, the player also has the option of paying with her health by running into and through them. That option disappears with boss and mini-boss battles, where the camera is locked onto a space until the boss is defeated. Finally, almost every enemy respawns if the player exits the entire level and later returns. The exceptions to that

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rule are the maverick bosses, who die permanently. Depending on how much terrain each enemy controls, its death equates to one of these four tiers of spatial value.

A second kind of exchange takes place around the items that enemies randomly drop when they die. These items can restore Mega Man's health, provide ammunition for special weapons, or give the player an extra life. Health items create an equivalence between the life of each enemy and the potential damage they can do—and it works out that an enemy life is worth roughly one bar of Mega Man's health gauge. Moreover, the player can find "Sub Tanks" scattered around the levels that allow her to store any excess health for later use. This motivates the player to hunt enemies and accumulate a store for boss battles. In particular, the respawning enemies become a source of quick kills that serve to endlessly replenish health. This second trade supplements the value of the smaller respawning enemies by converting their death into a steady, if slow, trickle of life.

A third kind of trade happens in the player's encounter with the eight maverick bosses, who each have a special weapon that Mega Man can steal after defeating them. This exchange endows the maverick with a singularity that is missing from the mini-bosses. The weapons Mega Man acquires work extremely well against some specific targets. The death of a boss therefore depreciates the value of other enemy lives.

Phrased in the language of violence and death, this game economy seems cold and calculating. Indeed, the game asks the player to treat enemies as a utilitarian means to optimize her route through myriad challenges. Yet we can also see these encounters as producing meaning within an artificial life that previously had no value for the player. Enemies are no more inherently meaningful than the blocks of the landscape, and

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the player has no reason to want them to persist or disappear. By establishing an economic relationship with the player's time and effort, the abstract pixels inherit a little bit of the player's own humanity. Through repetition, the process of the exchange can become a kind of commodity fetish where the value of an enemy grows independent of the player and endows a virtual creature with life. If an enemy's life is worth only a modicum of health or space, that equivalence still connects the player's desires to the enemy's existence. The pure utilitarianism of game death contains the seeds of something else, where electronic life returns to confront the player as an independent force with its own demands.

Ethics of the Goal

Ethics is the branch of philosophy that deals with questions of justice, duty, and the good. Several kinds of questions address the ethical dimension of engaging with enemies: When does the player feel guilty or torn while playing? How do enemies expect a player to behave, and what do they demand of her? Does the player find moments for growth or development? These questions, and others, have answers in *Mega Man X*. The kind of ethics under consideration here, however, should not be confused with an external or reflective ethics. The question is not whether people should play video games or whether games can provide models for real-life action.[17] Instead, we are concerned only with the immanent system of the game world—an ethics *for* enemies and avatars rather than *about* them. The relevant questions are: How can Mega Man be good? What kinds of virtues do the bosses embody? What taboos bind enemy action?

These questions emerge when actions in the game world are considered as a system. There is a split in structuralist

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views between empirical speech and the idealized rules that belong to the system of language. Only the latter gives rise to demands, the "should" and "ought to" of grammar and pronunciation, because they establish normative values against which to judge individual utterances. Something similar can be said of ethics, where it is the possibility of a choice between the practical and the good, or what's pleasurable and what's lawful that defines a specifically ethical problem. To pose a problem, there needs to be a discrepancy between two systems of value. First, a game sets a goal for the player—beating a boss, completing a level—but then it challenges her with a choice about how to accomplish it. This system is one composed from the actions that are available to the player. Abstractly, we might criticize *Mega Man X* as ethically dubious because the player solves problems through violence, but within the system of the game, Mega Man has no possibility of talking through his differences with the enemies. The capacities of the game avatar differ substantially from our own: Mega Man is more powerful but also limited to walking, jumping, dashing, and shooting. The system of ethical action thus depends on a choice between ways of using that limited repertoire.

Within these constraints, *Mega Man X* makes it possible for the player to deploy different strategies when encountering an enemy, and some strategies take on an ethical valence. An enemy called a Hoganmer, for instance, reveals several possible ethical commitments depending on how the player responds to it. The Hoganmer is a defensive enemy that shields itself from the front and only attacks when Mega Man gets close. In the standard encounter, the player charges toward the Hoganmer, which attacks with a ball-and-chain. The ball deflects Mega Man's attacks, so the player must jump over the weapon and position herself within its return path. The player

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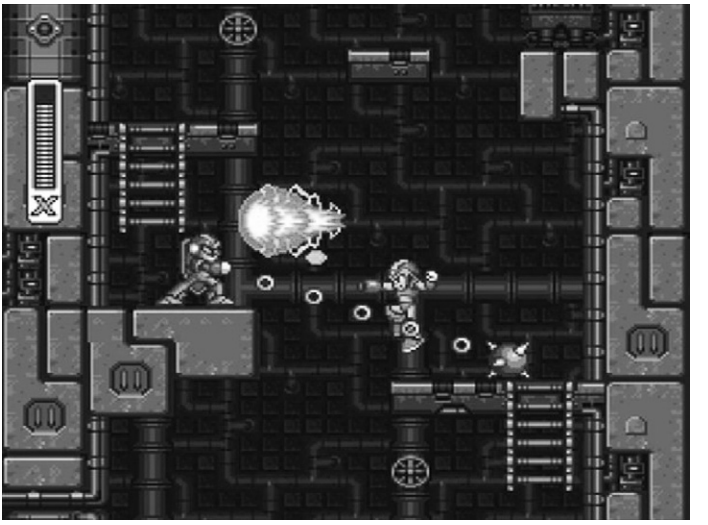

Figure 3.5
Mega Man jumping into the path of a Hoganmer's ball-and-chain.

must then try to kill the Hoganmer before the weapon comes careening back (figure 3.5). In this confrontation, the enemy throws down a gauntlet, in effect saying, "I will make myself vulnerable, but only if you do the same." There is honor in accepting the challenge and jumping into danger. However, there are other ways to engage the Hoganmer that deflect from its demand for equality.

In some cases, it is possible not just to jump into the gap, but to jump over the Hoganmer itself and attack it from behind, thus avoiding the danger of the ball and chain. Choosing to engage this way cheapens the honor of the Hoganmer like any ruse or trick.[18] A similarly suspect feeling occurs at other points when Mega Man attacks defenseless opponents. For instance, the Utuboros mini-boss is a majestic creature swimming back

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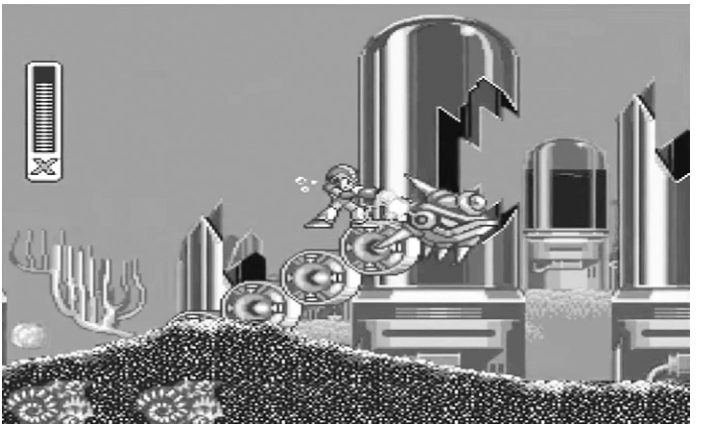

Figure 3.6
Mega Man shooting an Utuboros from an invulnerable position.

and forth across its arena. Its undersea environment is open, and the enemy seems to care little for the player's presence, which puts the burden of initiating violence on her. There are two strategies for this encounter: (1) jump into the path of the Utuboros and shoot before quickly dodging out of its way or (2) jump onto its back and shoot into its defenseless head while the Utuboros desperately tries to twist around (figure 3.6). The second option is the easier and quicker path, but it treats the enemy as a mere inconvenience and cheapens its life. This is especially egregious because the Utuboros looks and acts like a wild animal. In both encounters, we can make out a taboo on killing something when it cannot fight back.

The player has a third strategy with the Hoganmer: simply run past it and take a small amount of damage in the process. Running past enemies feels wrong, though, as if the player is leaving a job half finished. Perhaps this is because the robots are programmed for the singular purpose of destroying Mega

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Man, and ignoring an enemy denies it a chance to prove its mettle. Bypassing the enemies, Mega Man steals the spatial progress he was meant to win and greedily withholds the modicum of value that the game's economy grants enemy lives. A second ethical guideline therefore asks us to actively encounter each enemy in our path and treat them as at least a means, if not an end.

A final strategy for dealing with the Hoganmer involves attacking it from safety using one of the secondary weapons that the player gains from defeating a boss. In this case, the Hoganmer can only patiently await its death at the hands of a coward. Ordinarily the player does not feel such guilt for using these weapons, but occasionally they dramatically alter the flow of the game. In particular, bosses and mini-bosses are often weak to a specific weapon. Exploiting that weakness radically transforms the encounter from a match of wits and skill into a slaughter. With the correct choice, the player does not even have to dodge and can safely ignore the boss's intricate pattern of movement. A boss becomes a simple object to dispose of. This is the easiest path, but it feels debased. Indeed, *Mega Man X* speed runners have a dedicated category for beating the game using only the basic blaster, and it is a mark of pride. The game thus denies the possibility of ethical action to any player who has not mastered Mega Man's skills.

Do not attack defenseless enemies; do not avoid the enemies in your path; do not exploit their weaknesses. Each of these ethical precepts engages with the economy of enemy destruction and presents a situation where the player chooses between a shortcut that undermines the conflict and a direct confrontation. The ethical path is more arduous, but it is the one that enemies themselves choose. Direct, violent conflict is an ethical norm in *Mega Man X*. Each enemy engages that

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norm differently, but through those differences, they enter a system that lends meaning to their lives and makes demands on the player.

* * *

If the mechanics of jumping characterize a game's protagonist and level design builds a spatial narrative, then the enemies of a platformer embody its philosophy. A game frames its world in a particular way—excluding some kinds of beings, ideas, feelings, and values while also creating others that have never existed in the real world. Each time the player encounters an enemy, that enemy contributes some small detail to a larger picture about the game's logic through the nuances of its attacks, how it responds to the player, its position in the level, and what it appears to be doing. Collectively, enemies form a semiotic system by relating things with consistency, necessitating creative leaps of abstraction, characterizing objects through relations, and establishing ideals. That systematicity allows the player to see a mere collection of pixels on the screen as a living, breathing individual with an imagination and a purpose.

Physical reciprocity is the unquestioned background assumption that makes these game worlds come to life. It is the episteme of the platformer, the air these games breathe. However, it stands out most visibly when we consider the issues that cannot be presented through that reciprocity: namely, a politics of enemies. Certainly many elements from a political worldview can be shown in platforming games, but if politics requires some system of collective and creative action, then the platformer is uniquely devoid of it. In a world where communication happens through violence, the platformer refuses the means of coordination between enemies. In those rare

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situations where enemies can coordinate by bumping against one another or shooting each other, that coordination is for destructive ends—which is not to say that it is impossible to transform the mechanics of the platformer to circumvent this limit and represent a political aim. *Oddworld: Abe's Oddysee* (1997) succeeds at representing politics, for example, by allowing the player to mind-control enemies and instruct allies, but in general the spatial premises of the genre makes communal projects difficult to think.

Enemies form a complex system of differences. Each time the player experiences the singularity of a live encounter, it hones her sense of how this moment differs from all the others and introduces nuance into an ongoing conversation. Through these variations, enemies explore the possibilities of the platformer, showing us new ways to occupy space and live out a life within the limits of the virtual world.

Design Exercises

The following exercises are meant to bridge the philosophy of enemies with specific design choices about enemy abilities and statistics. They are designed to express a worldview. All of these exercises work best as part of a workshop where participants can share and discuss their choices.

Before you begin, brainstorm the problems and ideas you want your game to evoke because this will guide all your choices. I provide three examples here, but feel free to invent your own.

- **Panpsychism** is the belief that all things have a mind—from rocks to animals and from humans to planets. Different things might have different kinds of minds, but all things deserve kindness and respect.

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- **Platonism** is a philosophy with many aspects, including the idea that the physical world is only a copy of some ideal world; that perfection consists of wisdom, courage, self-discipline, and justice; and that human nature can be anatomized into desire, spirit (emotions, anger, excitement), and reason.
- **Communism** is a political and economic belief that human beings are equal and that property should be communal. It argues that each person should contribute to the collective according to their ability, and resources should be distributed according to need.

1. Before creating individual enemies, you will create some general categories. Below is a list of a few common traits of platforming enemies, and you can find more in an article by Garrett Bright.[19] To start off, draw up three columns: "All Enemies," "No Enemies," and "Some Enemies But Not Others." Think about your worldview and place the following traits in one of those three columns:

Stationary	Has a shield
Walks	Has a weak point
Stands and ducks	Invulnerable
Falls from the ceiling	Revives after death
Jumps	Segmented
Changes direction	Carries another enemy
Follows the player	Throws or shoots things
Teleports	Creates enemies
Bounces off walls	Transforms
Mirrors the player's movement	Hides
Ignores level geometry	

2. Take this categorization a step further by circling the most important trait according to your philosophy in the "Some

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Enemies But Not Others" column. Create two new columns —one for creatures with this important trait and another for those without it.

3. Now we're going to start individualizing the enemies. Look at the important trait you circled. Brainstorm three reasons why someone who believes in your worldview would exhibit the trait. Be creative here. Imagine what a rich interior life of emotions, beliefs, and desires that might lead someone to behave this way. Now imagine three reasons why someone might not exhibit that trait. Try to make both equally convincing and compelling. The range of possibilities is important to representing the full extent of a philosophy.
4. Describe six enemies that correspond to these six reasons. What do they look like? How do they behave? What are their strengths and weaknesses? Include other traits from the same column and describe how they work in concert with the beliefs or desires or emotions you outlined.

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4 Every Game Is Two Games

On opposite ends of the room, two seeds fall from the sky (figure 4.1). Where they land, two serpentine and bright red vines grow out of the ground and bloom into pixelated white flowers. The room is bordered by a laser of red light that pulsates as the roof slowly changes into a garbled pattern. In the middle of the room are a ladder and a door, reminiscent of the red doors of *Super Mario Bros. 2*, that lead to silhouetted shadow lands (and perhaps that is where this game exists). You control a monochrome, chalk-white girl. Like the room, she is pulsating. Her hands and feet move back and forth to some unseen rhythm without your input. When you press a button, the girl turns to look left or right and moves in that direction, but her arms and legs continue the same uninterrupted jig. You cannot jump in this world. Instead you can rapidly ascend the flower stalks, push yourself down into the earth, and scale the walls with an odd jittering motion. There is no music except a slow and arrhythmic hum that rises and falls like the inhalation of lungs. In the background the words "STRAWBERRY CUBES" are drawn and eaten away with each breath.

So begins Loren Schmidt's *Strawberry Cubes* (2015), an experimental platforming game that breaks and discards most

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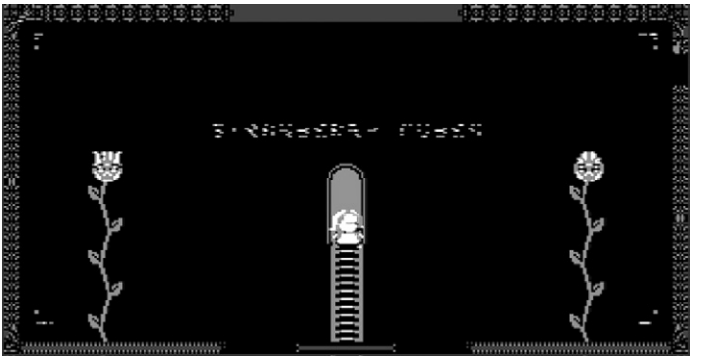

Figure 4.1
The introductory screen of *Strawberry Cubes*.

of the elements of the genre I have described in this book. To talk about genre is to talk about its tendencies, affordances, and expectations, but a designer need not accept these conventions. She might raid a genre for its untapped possibilities; she might borrow in a piecemeal fashion that disregards its internal coherence; she might subvert the player's expectations to tug on surprising emotional responses; she might actively resist and negate its repressive elements. At different moments *Strawberry Cubes* does all these things. For example, the game takes away the ability to jump but repurposes elements of jumping that are normally ornamental. The push off that would otherwise initiate a wall jump is isolated as a way of glitch-climbing a surface. Quirks of gravity and collision detection allow the avatar to push through impossible spaces. Similarly, the levels in *Strawberry Cubes* are clearly built with intention, but the logic eschews common design principles of clarity. Space loops around, doors lead every which way, the colors and shapes of the landscape change and disappear, and random buttons teleport the player across the world. There

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Figure 4.2
An overabundance of enemies signals their absurdity.

are enemies, but they seem lost in the world and bereft of any clear goal. Deadly spikes are arranged in the whimsical shape of a sailboat, and enemy frogs intermingle in an impassible blockade (figure 4.2).

Strawberry Cubes uses, and needs, an idea of genre to achieve its effect. Without the player assuming that space should be organized for her convenience, the game would not be so disorienting. Without the genre's long history of static and discrete tiles, the spilling, leaking, and interpenetrating lines of *Strawberry Cubes* would not feel so alien and biological. Its twists, however, show that the meaning of genre is never simply given. The common ways that a genre communicates can always become the elements of some higher-order metalanguage that comment on those norms. In structuralist semiotics, Roland Barthes defines a metalanguage as one or more signs (both signifier and signified) that become the subject matter for another signifier.[1] The words *noun* and *verb*, for instance, are metalinguistic terms because they let me talk about the operations of language. Like *Strawberry Cubes*,

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semiology itself is a metalanguage that is composed from the same material it analyzes.

Loren Schmidt's use of conventions to comment on platformers is singular, but the game also borrows from a metalanguage common to the genre itself. This metalanguage is made up of elements that seem secondary and inessential to the main course of play: collectibles, power-ups, and secrets. Indeed, where other genres incorporate these odds and ends into the strategic rhythms of a game, platformers go out of their way to remove their utilitarian aspect. In place of a gameplay function, platforming games use collectibles to show alternate ways of constructing levels, power-ups to show the variety of actions an avatar could potentially perform, and secrets to hint at new motives for playing. Every game contains two—or more—games hidden within it. Together they create a metalanguage that any platforming game can use to reflect on its position within the genre. Collectibles, power-ups, and secrets are tools for the designer to anticipate and suggest variations in the style of play and reincorporate those variations into the fabric of the game. Platforming games always go beyond themselves. Loren Schmidt's *Strawberry Cubes* is also aware of this power and makes novel use of each of these three elements. I return to *Strawberry Cubes* at the end of this chapter to explore the seeds the player collects, the power to spawn more avatars that the player gains, and the secret glyphs hidden behind thick walls. First, however, we need to unpack these elements in a more traditional setting.

Merely Collectible

A collectible is anything that a player can collect within a game. Collectibles can be unique objects hidden away in the

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recesses of a mineshaft, they can be common trinkets sprinkled across the land, they can be dropped by enemies, or gathered as a reward. In role-playing games, the player collects items—swords, shields, armor, relics—that change her statistics and grant special powers. In first-person shooters, the player collects ammunition and health to bolster her fighting power. In action-adventure games, the player collects bits of lore, audio logs, journal entries, or photographs. In arcade games, collectibles grant points and build toward the fame of a high score. In online games, the player collects achievements that mark her progress toward some abstract sense of completion. All of these kinds of collection offer a reward or benefit that transforms a qualitative experience of finding a unique game object into an act of accumulation.[2]

Platforming games have many useful collectibles, but they often take on another guise as something merely collectible that lacks any practical use. Finding 100 coins in *Super Mario Bros*. grants an extra life, but any single coin offers a tiny, fractional benefit and one that pales compared to the instant gratification of 1-UP mushrooms. Collecting rings protects the player from damage in *Sonic the Hedgehog* (1991), but after grabbing a handful, any further rings become superfluous. However, that excess does not stop the player from seeking out and grabbing the now useless objects.[3] In other genres, when a designer places ammunition or healing items in a level, they are thinking about the ebb and flow of drama as the player fights her way across it. When a role-playing game or first-person shooter designer places a new bit of lore hidden in the desk drawer, they are rewarding a player who is thorough and cares enough to search each musty corner. In contrast, when a level designer scatters the collectible balls of yarn in a platforming game like *Bubsy* (1995) or layers surfaces with dirt

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to be vacuumed up as in *Dustforce* (2012), the emphasis is on the space the player must pass through to get that collectible. A coin marks out an ideal path, where having collected one object is far less important than the motions and movements that make up the act of collecting. This is what I mean by the merely collectible: the item is stripped of its utility and becomes a sign for communicating with the player about the meta-concerns of genre.[4]

If a designer needs to guide the player with coins, it is because she wants to highlight a behavior without forcing it on the player. Perhaps coins are simply floating above the most direct route, and they encourage the player to occasionally jump. Perhaps they are in a straight line along the ground, suggesting that she run without stopping. Perhaps they lead off the edge of a screen, offering hope that a leap of faith will be rewarded. The minimal and abstract value of a collectible lets it function as a gentle nudge. If used purposefully, collectibles can suggest whole styles of play. The bananas of *Donkey Kong Country* (1994) are placed in arcs that tell the player to rush forward without pause, and the level rewards that timing.[5] In *The Messenger* (2018), the placement of time shards suggests specific moves like gliding and tricks the player into attempting more dangerous maneuvers (figure 4.3). Collectibles are a powerful tool for the designer to communicate about the nascent possibilities for play that a level provides. Platforms offer an architecture or a playground, but collectibles show the player how to inhabit that world with rhythms, pacing, atmosphere, and drama.

By placing collectibles in a level, the designer incorporates a second way of playing next to the player's normal progression. The player might fully inhabit the path offered by the

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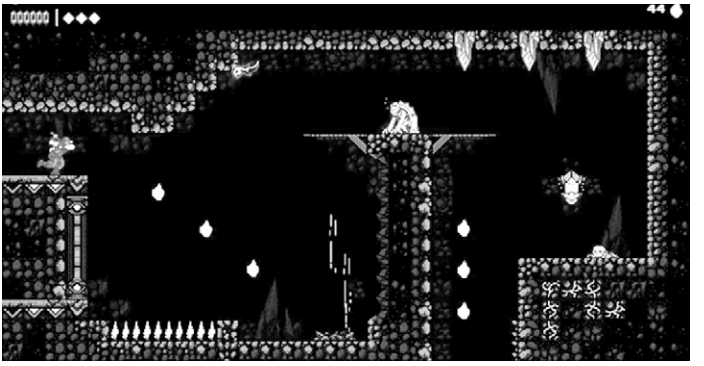

Figure 4.3
Time shards may draw the player into the path of a falling stalagmite in *The Messenger*.

collectibles, but it is more likely that she will follow it on some occasions and ignore it on others. There is a halo of virtual play that cajoles and comments on the player's actions. The platformer anticipates a possible player who is different from the one sitting in front of the television or computer. It privileges that virtual player and organizes space so that her impulses are rewarded and sustained, even if no one really plays that way. Phrased another way, collectibles reveal an unrealized level hidden within the level we are already playing. In this hypothetical level, coins define the one and only path, not just an optional route. Collectibles shadow forth this other world and bring it to life through the player's voluntary enactment. That other world does not differ much, but through this process of intimation, every level becomes two levels. Hidden within the folds of a platformer are other games—games whose rhythm is more headlong or loopy, more intricate or staccato.

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Powering Sideways

Like collectibles, power-ups come in a wide range of shapes. Some offer the player a new gun that does more damage or fires faster, and others recharge ammunition; some offer a permanent upgrade that changes the play experience, while others are temporary and involuntary transformations.[6] Power-ups are common to several genres, including first-person shooters, hack-and-slash games, shoot-'em-ups, and kart battlers. However, the paradigmatic power-up in platforming games creates a more ambivalent mixture of benefits and deficits that highlights the mere fact of change. When Mario picks up a mushroom, he becomes strong enough to break blocks, but his increased height counterbalances that change by making it harder to traverse tight passageways and avoid enemies.[7] An increase in one area is coupled to a loss elsewhere, and accepting a power-up becomes a choice between modes of play. Like collectibles, power-ups in platforming games are not about strategy but guiding the player's style. That is why platforming levels are designed to work regardless of the special abilities a player might have, because she may just as well avoid a power-up as choose it.

The kind of power-ups I have in mind are like those in *Little Nemo: The Dream Master* (1990). In that game, Nemo can befriend and ride animals that change his skills (figure 4.4). He can partner with a gorilla to punch and climb walls, a bee to fly and shoot, a frog to jump and swim, a lizard to squeeze into tight places, a crab to burrow, a fish to dive underwater, a mole to follow underground paths, and a mouse to chew through bricks. Not only are these abilities mutually exclusive, but many come with drawbacks that limit the player's speed, cause her to drown, or make her a bigger target. There

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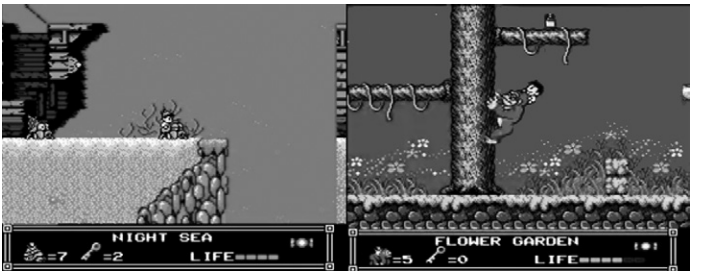

Figure 4.4
Nemo riding a hermit crab and a gorilla.

are moments when one ability or another is required to solve a puzzle, but typically the player chooses an animal based on a preferred style of play. The safe but slow ride on the back of the gorilla is an entirely different experience from the delicate speedy flight of the bee. "Power-up" is something of a misnomer; what is characteristic of platforming games is the possibility of playing in new ways.

In chapter 1, I described how game mechanics make us feel the qualities of the avatar's movement, and the changes wrought by power-ups expand that game feel. The transition from one state to another conveys the specific weight of the gorilla or the speed of the bee. However, power-ups also give the designer the ability to create dynamic and changing characters out of otherwise static avatars. Without power-ups, all the essential qualities of Mario—his speed, his slipperiness, his jump distance—remain the same from the beginning of the game until its end. Power-ups show that Mario can change—literally but also symbolically. Sometimes he is small and childlike, other times he is strong but awkward, and occasionally he is hot-headed. As the player picks up and loses these abilities, they tell the story of Mario's life. Power-ups speak about

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trajectories of growth and loss, of emotional development, of evolution and metamorphosis. The inclusion of a power-up reveals the dimensions of change that the game imagines as possibilities for the avatar.

A few examples will show what I mean. *Super Adventure Island* (1992) gives the player a choice between two weapon power-ups: throwing axes and boomerangs. The two are quite similar, with axes arcing up and down with gravity, while boomerangs arc over and back in a perpendicular reflection. Neither weapon is clearly superior or changes gameplay in a striking way. Nonetheless, the game foregrounds the choice between them by rewarding the player for picking up the same item repeatedly while avoiding its opposite. *Super Adventure Island* believes that personal growth depends on one's persistence and dedication. In *Super Mario Bros. 3* (1990) the player has a complexly structured set of power-ups. Mario starts out small but can grow by collecting a mushroom. A step beyond the mushroom are the leaf and the fire flower, each specializing in defeating a certain kind of challenge: the fire flower kills enemies while the leaf helps Mario leap over pits. Additionally, there are power-ups that Mario can only rarely acquire and that grant odd or niche abilities such as turning to stone with the tanuki suit or walking on spikes with the goomba shoe. The specialization of each power-up suggests that *Super Mario Bros. 3* understands change to be a pragmatic part of Mario's life. Gaining one feels like professionalizing, and losing that ability feels a little bit like a demotion.

Once we stop thinking of the power-up as something that makes the player stronger and faster and start thinking of it as a qualitative change, we can see that Mario's mushroom is part of a lineage of formal devices that alter avatar abilities. Nicklas Nygren's *Within a Deep Forest* (2006) puts the player

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in control of a bouncing ball that can change its substance at any moment with a key press. The player switches from plastic, to iron, to glass, and each state alters the weight, bounciness, and fragility of the ball. Some of these require an initial power-up to access, but the player is largely in control of the ball's transformation. The fact that these powers are reliable rather than temporary boons seems less important than the mutually exclusive play style each enables. Another common technique is to allow the player to choose among different avatars at the outset of a game. *Sonic the Hedgehog 3* (1994) and *Sonic & Knuckles* (1994) feature three avatars who function in different ways. As the default avatar, Sonic speeds through the world. Tails the fox moves somewhat slower but can fly for a short period, while Knuckles the echidnae has a shorter jump but can climb walls. The player can traverse the same levels as each of these creatures to experience the feeling of slight variation, like a power-up found on the start screen.

Changing abilities through a power-up rather than a character select screen represents another choice about where the game imagines transformation. If *Super Mario Bros. 3* and *Super Adventure Island* depict change as the result of everyday life, *Within a Deep Forest* internalizes change as something that is always possible—like a mood or a disposition. For *Sonic & Knuckles*, individuals do not fundamentally change, but they can be exchanged within some larger story. A recent variation on this theme highlights the point. *Rogue Legacy* (2013) includes a huge range of variations on its central platforming mechanics that the player's avatar can embody. These include traits like "Clumsy," which makes the player break objects when she walks by them; "Dyslexia," which swaps letters in the game's text boxes; "Near-Sighted," which causes the screen to blur at the edges; and "Vertigo," which inverts the screen so

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Figure 4.5
The heir selection screen in *Rogue Legacy*.

the player seems to be walking on the roof. Rather than giving her a choice from all these abilities, each time the player dies in *Rogue Legacy*, she leaves her money and armor to an heir (figure 4.5). The next time she plays, the past avatar disappears, and she will have to embody this new avatar, who combines a selection of random traits. *Rogue Legacy* knows that its mechanic implies that change happens only when someone dies, and it uses that idea to fashion an imaginary lineage of aristocratic blood.

For the player, the moment of transformation offers another pleasure. When Nemo climbs on the back of a frog in order to jump a little higher but walk a little more slowly, the player gets a peek behind the curtain of the code. The designers have spent weeks and months tweaking the variables behind Nemo's movement, and the numbers define what it feels like to play. When the player has the possibility of changing those variables, she gains access to a small bit of that same creative power. The player gets to experiment, to see how different

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ways of moving and acting feel, and then decide for herself what arrangement of parts is the best. Even though that choice is overdetermined, her minor manipulation can give a satisfying feeling of authorship over the game world. For a moment, the player becomes a game designer. So power-ups operate as both a symbolic discourse of avatar change but also a metadiscourse about the meaning of design itself. By transforming the mechanics of the avatar, power-ups grant a glimpse of another game.[8] In this other game, occasional patterns of movement, intermittent abilities, and temporary speeds afforded by the power-up become the foundational moves. Every avatar is two avatars. Power-ups allow the designer to try out an incipient idea that could later become the basis for a game, and the player experiences a slice of that yet-to-exist game. It is as if the flat logic of 2D space makes it possible to transpose any avatar into any platforming game, as if Mario could become Sonic with nothing more than a power-up.[9] Like collectibles, power-ups offer a glimpse into a virtual world, but instead of revealing new level designs, they show alternate avatars and mechanics.

Half Secret

Secrets are harder to define than collectibles and power-ups because they depend on an affective response. Secrets need to feel secret. To achieve that feeling, they must be hidden but not at random, and they need to be accessible but not obviously so. Secrets feel surprising while claiming an uncanny familiarity. Video games harbor many kinds of secrets. There are Easter eggs: secrets hidden by designers as an extradiegetic reference to their labor or as a metatextual joke. There are secret codes: debugging tools the programmers left behind

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or button combinations added for players to stumble across. There are secrets that players are not meant to find, hidden bits of leftover code or bugs that the developers never removed. And then there are secrets that exist as part of the game world: things hidden in obscure places, by a trick of the camera, by difficult puzzles, or by the player's own expectations. The platformer has an affinity for this last kind of secret.

We have seen how collectibles and power-ups can function beyond their utilitarian value, but secrets take this a step further. A designer cannot use them to balance a level's progress because the player is unlikely to look for them or plan her strategies based on a mere hint. Rather, to search for secrets is to be in thrall to an oblique desire that runs tangential to winning or losing. A secret provokes and challenges the player. It reveals another goal beyond the ordinary one, a goal that promises the player elite status and entry to a society of mastery and arcana. A secret rewards subversive and perverse forms of play—turning left when you are meant to run to the right, jumping outside the camera's bounds, running face first into solid stone (figure 4.6).[10] A secret reveals an unconscious counterlogic to play, one that always tugs on the player's fingers but normally goes unrewarded.

Achieving that uncanny effect is not about the rewards the player discovers but the process of hiding. The placement of secrets needs to establish new rules, and the level designer must follow them consistently. Moreover, those rules must differ from the stated goals of play while remaining within the scope of a player's imagination. As David Sirlin writes about the secret coins of *Donkey Kong Country 2* (1995), all the coins seem placed by "a single intelligence . . . [and] as the game progressed, I came to know how he thought and what he'd be likely to do."[11] That feeling of intentionality is what makes

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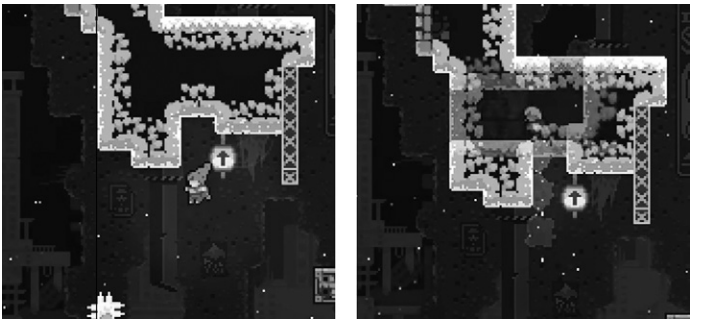

Figure 4.6
What looks to be a solid block of snow conceals a secret passage in *Celeste* (2018).

it possible for the player to trust her impulse to jump down a pit in search of something as yet undefined. The player will not always guess correctly, but each discovery should give her the means for further pursuit. Secrets need to feel motivated and devious; they need to dare her to try things and slowly draw her into ever more convoluted ploys. Achieving the feeling of intelligence is a subtle design challenge, but without it, many video game secrets end up worthless. A secret that feels mechanical or artificial loses its magic and becomes a waste of time.

Secrets thus give the designer a new tool. Alongside enemies, another more devious intelligence appears. Where enemies share a reciprocal embodiment with the avatar, the secretive intelligence is characterized by its transcendence. It occupied the world before the player ever arrived but is forever absent; it is able to break the implicit rules of the game at will and do the impossible; it toys with the player and leaves condescending rewards to show that it is always two steps ahead; it seems to have a synoptic view of the world, one that suggests some

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larger plan or meaning. If the on-screen avatar is related to its enemies, this intelligence is more akin to the player herself. Secrets allow the game designer to speak of conspiracy, of history, of theology, and of what must remain absent. Secrets are the trace of this other intelligence that can never show itself.

To find the secrets, the player must set herself a new goal, at odds with simply completing the level. That goal might be inspired by the rewards that secrets grant, the impulse of finding everything, or the pleasure of seeing through the feints and ruses of the intelligence. Behind these specific goals, though, is another desire: the player follows the secrets to discover why they were placed. There are clues about that guiding purpose everywhere. The architect leaves an extra life here, jump-boots there, a hidden level over here, and the specific rewards convey a clue about what that intelligence hopes the player will do. The player anticipates that each new secret will add to her hoard of information and reveal a higher goal. The intelligence has an assortment of ruses and tricks, and the player bets that correctly interpreting those stratagems will grant insight into the mind of the secret keeper.[12] In all of these cases, the player who is drawn to secrets shares something with the medieval Christian monk trying to read divine intention within the book of the world. Like the monk, that intent will always escape her and leave even the most rigorous quest disappointed. In truth, the level designer rarely has a goal any grander than making the player tarry a while, but the pursuit produces its own illusory quarry.

As with collectibles and power-ups, secrets create a virtual second game. That hidden game is one played with all the same pieces but directed toward a new goal. In a level where the player could win by traveling left to right, perhaps she decides to explore thoroughly or climb as high as possible.

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Every goal is two goals. The designer teaches a game's main goals through explicit tutorials and implicit affordances, but hidden goals require sleuthing and painstaking trial and error. Such elusive ends point beyond themselves to the player's creativity and ability to generate new metagames.[13] Secrets offer a discourse of devious intelligences, but as a metadiscourse they speak to the reasons we play and the pleasures that draw us repeatedly into video games.

* * *

A platformer is not a single game. If it has collectibles, power-ups, or secrets, there is at least a second game hiding within the first. These virtual others do not necessarily align, so there might well be three other games hinted at in the margins. Why stop there? The possibilities mix and match in combinatorial formations. If I am right that these three elements, stripped of their primarily utilitarian function, are paradigmatic of the genre, then things get even weirder. In that case, when we imagine a new, virtual game brought into existence by searching for secrets or following the path of collectibles, that second game would have its own secrets, power-ups, and collectibles. These virtual secrets would suggest a third level of imaginary game, and so on. In that *mise en abyme* or infinite regress is a web that unites all platforming games. Through the slight changes to the level, the mechanics, and the goals suggested by collectibles, power-ups, and secrets, one game subtly changes into another. It creates a metadiscourse in Roland Barthes's sense that allows us to speak about the platformer as a genre.

If we return to *Strawberry Cubes* in light of this discussion, its symbiotic relationship with the platformer genre will be clearer. For a game that breaks so many of the genre's

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conventions, *Strawberry Cubes* has a relatively straightforward take on collectibles, power-ups, and secrets. One of the avatar's abilities is planting flowers—like those we see on the introductory screen—but they require seeds that the player must collect (figure 4.1). While the seeds are sometimes sparse, they quickly regenerate and lose their utilitarian value to become merely collectible. The player can also gain new abilities in *Strawberry Cubes* by finding power-ups in the world and by searching her keyboard for undocumented keys that give new abilities. To change the avatar, the player must reflect, experiment with her keyboard, and discover the odd connections between keys and screen. Power-ups in *Strawberry Cubes* imply that transformation is a process of self-discovery. Among these power-ups is one that recodes the game's glitch aesthetic as a variation on John Conway's *Game of Life* (1970) simulation (figure 4.7). Each pixel lives, dies, or reproduces depending on how many of its neighbors are switched on. The power-up gives the player an opportunity to manipulate the rules of that simulation and gain control over the life and death of the pixels. Here the complex agency involved in game design, especially creating sets of dynamically interacting rules, has been boiled down to a button.

Figure 4.7
Seven frames of *Strawberry Cubes* (top) and the *Game of Life* (bottom). The *Game of Life* has been colorized so cells that died in the last turn are light gray.

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Strawberry Cubes has no explicit goals or methods of progression. Instead, the strange purple glyphs that constitute the game's primary secrets slowly take over as the player's sole motive. However, these items never become a straightforward goal because they can only be accessed by breaking the game with glitches. Yet these secrets are its connective tissue and offer a story about collecting decontextualized fragments that are always on the verge of making sense.[14] *Strawberry Cubes* uses collectibles to show a variant path without first offering an ordinary one; it uses power-ups to show wild possibilities while stripping the character of a basic jump, and it promises transcendence through secrets without any way of simply winning. *Strawberry Cubes* is the closest thing I can imagine to a direct representation of the virtual halo surrounding all platforming games.

I began this book by thinking about genre in a few different ways—as a contract between designer and player, as a set of creative constraints, as a historical negotiation—but here is a new principle uniquely underpinning the continuity of platforming games. By incorporating the metalanguage of design and construction into its basic pleasures, platforming games foreshadow the most dramatic shifts and the most transformative subversions that designers can imagine. That nexus of possibility seems an apt place to end my exploration of the genre because it points to all the connections that still need to be developed. I have tried to tease apart some of the major elements, but structuralist semiotics tells us that it is the differential relationships that matter. Those connections are redrawn by each game in ways that shift the meanings of play. I hope that future designers can use this book to explore corners that are only dimly glimpsed on the horizon of this virtual web.

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And that scholars will take up and challenge my interpretations, aided by games that reinvent these conventions. And that players find new pleasures in the experiments of games like *Strawberry Cubes*.

Design Exercises

The following exercises use secrets as a tool for expressing a game's themes. These exercises are most useful if you are already working on a level design. If you aren't building one of your own, you can use another platformer as a basis and imagine that you are redesigning it.

1. To unify your secrets, imagine the people who are responsible for their creation. Write out a short background story for these builders; maybe the level was constructed among the ruins of an ancient city, or a rival has graffitied her initials in hard-to-reach spots in order to show off, or a malicious god has placed booby traps to entice the curious to their doom. Whatever story you come up with, decide: Were the secrets originally meant to be hidden? What was the motive behind their creation? What value did the builder place on the objects or places being kept secret?
2. We are going to discover how the thought process of the secret builders differs from the game designer's. Examine a level in your game (or another game you're using for this exercise) and list all the goals and subgoals you can. For a level in *Super Mario Bros*. this might include:

GOAL: Reach the flag at the end of the level.

SUBGOAL: Jump over pits and blocks that are in your way.

SUBGOAL: Travel to the right.

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GOAL: Get to the end within the time limit.

SUBGOAL: Run really fast!

GOAL: Don't die.

SUBGOAL: Kill enemies before they can hit you.

SUBGOAL: Collect coins and power-ups to increase the chances of survival.

Now you're going to subvert these goals. Choose one of them that seems to go against your builder's motives and invent two or three alternative goals. Maybe a new goal is, "Wait until the time runs out," or, "Walk without ever running." Check to make sure your new secret goal doesn't inadvertently reinforce one of the other, regular goals either.

3. Imagine ways that the secret goals can create new possibilities for the level. Maybe a door at the beginning of the level opens only as the timer ticks down. Maybe if you cross the finish line with zero seconds left, you get to keep going. The point is to take your new and abstract goals and turn them into concrete elements of the level design.
4. You should now have somewhere between six and nine new architectural ideas for level design. In this step, you're going to winnow them down based on your secret builder's personality. From the two or three variations you designed, choose one, and write a sentence or two about what it should convey about the builder. Use these sentences to place secrets in other levels, and each time try to refine what the player learns about the secret builder.

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Conclusion: No Cheat Code

In the Introduction, I made the case that a semiotics of video games needs to be constantly on the move, attentive to the inventive ways that games signify, and ready to abandon its analytic categories. I advocated for an ad hoc structuralism that makes a researcher out of every player. My reasons were half theoretical and half historical. On the theoretical side, Espen Aarseth made a powerful case that there could be no general semiotics of computational signs. On the historical side, a changing disciplinary culture in game studies discarded structuralism before it could be properly developed. Cultivating structuralism as a practice of scaffolding and thinking, rather than a set of fixed and objective results, is one way to respond to these problems.

At the end of this experiment, there is another reason to be tentative with structuralist conclusions. There cannot be a simple return to the heyday of structuralism in the 1960s, and there are several good reasons that structuralism gave way to a diverse set of poststructural positions. With the benefit of that hindsight, I see three big questions that game studies might pose to structuralism today about community, materiality, and pragmatism. Each represents an important strand of

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contemporary research that structuralism ignores or excludes. This book takes a detour through a lost moment of game studies history to recover something special. Part of that recovery needs to be negotiating a return to the present in conversation with contemporary work.

Let us start by looking at the question of community. In the Introduction, I said that this is a book about what platforming games mean to players. We might well wonder who those players are. They do not make an appearance in this book as concrete human beings who value different things, who see game elements through a biographical lens, or who play in a unique style. Structuralism attends to what is common and invariant across a community, and it abstracts shared experiences from a multitude of individuals. That emphasis on generality can easily flatten and ignore important differences among people. Game studies has learned a great deal about how players differ from one another through detailed ethnographic research. Scholars like Celia Pearce got to know players by participating as guild members in massive multiplayer games, others like T. L. Taylor have worked with the digital archives of live-streaming communities to chart the desires and values of public play; still others, like Kiri Miller, have pioneered ethnographic accounts of racialized, gendered, and national experience within single-player game worlds.[1] These kinds of approaches, alongside methods from audience studies or user experience research, paint a detailed picture of how individuals make meaning out of play.

In my view, however, these explorations of smaller communities do not remove the need for a structuralist account but attune us to different levels at which structures operate. If structuralism risks homogenizing, then the opposite risk is that we atomize meaning and render it into a merely contingent

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empirical fact. Structuralism reminds us that meaning can exist only as a system that is shared within some community, however small, and that every meaningful experience involves claims that go beyond the momentary and local.

As an example of how my particular claims might change for different communities while keeping the general method, we can look at chapter 3, where I argued that the player of *Mega Man X* develops theories about enemies. I gave an interpretation of its semiotic system that highlighted a folk ontology of enemy types, a folk epistemology about how enemies think, an economic intuition about the relative risks and rewards of their actions, and an ethical evaluation of ludic means and ends. We can easily imagine that different player communities would come to different conclusions about what enemies are thinking or what the game world idealizes. Indeed, I used the example of the *Mega Man X* speed running community, a group that plays in idiosyncratic ways and places an extreme value on dexterity, memory, and persistence. We cannot take it for granted that everyone will lump enemies into shooters and dashers. Even the distinctions between ontology and ethics might be peculiar to a Western metaphysics that naturalizes a boundary between matters of fact and matters of concern.[2] However, the act of taking up a structuralist lens does not depend on these categories because it is about relations—not the things related. It attunes us to the ways that different play communities will develop their own structured categories. In that sense, a tentative structuralism should have a place within explorations of individual player experience.

A second question that might be raised by contemporary game studies is that of materiality. How a game looks and feels can change dramatically depending on the hardware it is played on: a cathode ray tube television displays pixels as

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circles that blur and overlap rather than the discrete rectangles of an LCD screen, and SNES controllers are contoured for different hands than Xbox 360 game pads are. Materiality has also been theorized by platform studies through the unique combination of hardware and programming environments that shape the development of a console. Still another group of scholars understands materiality in terms of the player's body and affects, how games situate people in a living room or at a desk, how disabled players engage with standardized equipment, and what we can learn from players' facial expressions and eye movements. Materiality can mean many different things, but these materialist approaches share an emphasis on the singularity of a situation and ways that even the most minuscule or obscure detail can constrain design choices. In this sense, materiality is what unexpectedly resists, what interrupts meaning, causes it to stammer, stumble, or divert its course.

Structuralism not only downplays these elements but defines itself by the exclusion of material substrates. When Ferdinand de Saussure elucidates the linguistic sign, he specifically contrasts the signifier as an ideal unit in the speaker's mind with the scribblings in ink that happen to embody it. Similarly, the signified object is not any actual material thing, but already a generalized idea that can be recognized in many situations and by many people. Just as we often ignore and unconsciously correct the repetitions and grammatical slips in the speech of an interlocutor and construct an idea of what they "really mean," structuralism can paper over the material details of how a game unfolds. It concerns itself with the things people want to communicate, rather than the full range of what might be conveyed by the slips and errors in how a sentence is put together at the moment of enunciation.

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The difference in method is clear if we contrast the way I analyzed level design in chapter 2 with the way Nick Montfort and Ian Bogost explain the levels of *Pitfall* (1982) by referring to the Atari 2600's technical limits. The structuralist account of level design referred us to a series of binaries that designers could draw on in expressive and communicative ways such as the emotional valences of high and low points in a level, the foreshadowing of passages that widen or narrow, the associative logic that connects insides and outsides, the unconscious visual feeling that divides the active arena from the deep black interstices, and the way the camera creates space through stasis or motion. Montfort and Bogost, by contrast, highlight the fact that the Atari 2600's 4K of ROM was not enough to store the data for the varied level screens.[3] Instead, the programmer and designer, David Crane, created an algorithm that would mix and match game elements based on a relatively simple "polynomial counter" that produced an arbitrary number for each screen. The eight bits composing that number were then used to designate a pattern of trees, obstacles, ground, and walls (figure 5.1).[4]

In *Pitfall* the constraints of the physical platform undercut our ability to read the level as designed for a specific experience. The designer is not free to place a ladder where it will best convey the dread of descent or let the camera seamlessly follow the player. By turning to the material constraints on meaning, we gain insights that are less speculative, more historically grounded, and that have the power to surprise. And yet, even in the most material analysis, we will miss something if we do not pay attention to the semiotic dimension. A console like the Atari 2600 does not exist as a fixed set of limitations from its launch, but comes into being as a development platform through a continual set of negotiations

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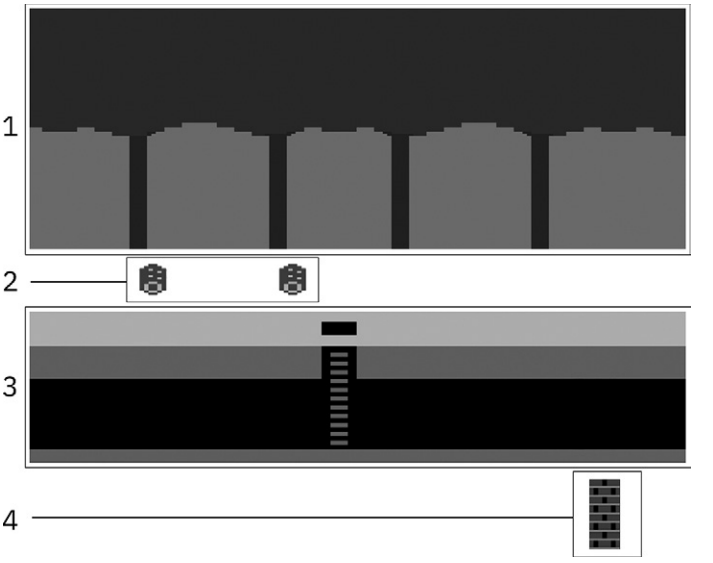

Figure 5.1
Level design in *Pitfall* consists of randomizing four elements.

about what can be done within it. As Montfort and Bogost show, designers constantly push the boundaries of what seems possible with the hardware, so that games produced only a few years apart would seem impossible by earlier standards.[5] The platform exists because an engineer wondered "What if we tried x . . . ?" and stubbornly believed that "it should be able to do y." These ideals are dictated by virtual communicative and expressive goals. Equally, players have a sense of what is possible with the hardware, and their rough guesses exert market demands on designers. The expansive levels of *Pitfall*, despite their technical limitations, give rise to an audience reception that views them as intentionally designed beyond anything that is materially possible. That idealization has its own reality

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quite apart from the hardware, and it imposes a different set of constraints that stem from a grammar of meaning. A structuralist lens can help us keep this fuzzy and imaginary sense of the platform in view throughout a material analysis.

A third problem is that structuralism classically puts up a strong boundary between two conceptions of meaning: semantics and pragmatics. Semantics studies the meaning of linguistic units like words, while pragmatics looks at how the context of use affects meaning. Structuralism's emphasis on semantics came in for criticism from a variety of quarters, because it evades issues of power, politics, argumentation, and persuasion. The ordinary language philosopher J. L. Austin, for instance, developed a theory of performative utterances, where words change the world through the very act of saying them, such as legal pronouncements like "I find you guilty" or acts of promising and apologizing.[6] Performative statements break down any clear distinction between the two domains of linguistics, and poststructuralists like Jacques Derrida argued that such action can be extended to all speech and writing.[7] Again, the structuralist emphasis on idealized units of meaning can ignore rich contextual details.

We can see this emphasis in chapter 1, where I looked at jumping as a "ludeme" or basic unit of gameplay. In that chapter I argued that we could discover a whole range of subtle shadings in jumping. Some facets of its meaning derived from the nature of arcing motion as an elegant navigation of complex vectors and others from the different ways designers can tweak a range of variables to make jumping feel floaty or slippery. Some coloring came from the relation between jumping and the other types of verbs a player has available, and some came from the literacy of commonplaces that a well-versed player brings to the game. Finally, some tones are the result of

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a comparison between the player's body, dreams, and imaginary of jumping and the game's own insistence on policing a certain type of movement.

Game studies, as I argued in the Introduction, inherits the opposite problem. Especially after the influential work of Ian Bogost on the rhetoric of video games, game studies developed a tradition of pragmatic analysis without a coequal line of semantic thought. People have theorized ways that games teach skills, change beliefs, habituate everyday behaviors, develop empathy, and offer opportunities for argument. This branch of academic theory has been widely adapted by game designers making "serious" or "meaningful" games, so that there are now huge fields of educational games, advertising games, military simulations and health simulations, political propaganda games, exercise games, and more. These can involve quite complex and deft understandings of how ludic and designed experiences convey meaning to players. However, the concept of meaning is a relatively univocal and causal one that succeeds when it achieves some measurable effect.

In a context where the pragmatic/semantic distinction has tilted far toward utility, a structuralist semiotics can serve as a corrective that reignites our imagination of the subtle distinctions between game mechanics. By highlighting the differential nature of meaning, structuralism shows us how any number of small design choices can undermine the pragmatic intent of a game and open it up to multiple interpretations. It gives us a way to speak about game literacy and how familiarity with controls or genre is inextricable from a set of connotations derived from their historical use. By itself structuralism is no better than rhetoric, but we can recover some of its nuance as part of a larger project of interpreting games.

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Across these three questions that contemporary game studies might pose to structuralism, we can see both its limits and its continued importance. As an approach, structuralist thinking allows us to tease apart nuances that tend to fuse together, and it speaks in precise ways about the abstract and ideal life of games that is real to players. It cannot be the only tool in our belt, however, and we cannot take its categories as fixed and universal. Rather than a general structuralism of games, I think we gain a more contingent and situational set of conclusions from this spelunk into disciplinary and methodological history. Or, better, a task that must be taken up anew each time, a task that the player herself takes up anew in each game, and one that makes it difficult to distinguish play from research.

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Notes

Introduction

1. For a version of this argument, see Maria Garda, "Nostalgia in Retro Game Design," in *Proceedings of the 2013 DiGRA International Conference: DeFragging Game Studies* (2014).

2. Tristan Donovan, *Replay: The History of Video Games* (Lewes, East Sussex: Yellow Ant, 2010), 29–36.

3. For a history of these games, see Stefan Gancer, "The Clones of Donkey Kong," *VGArc: The History of Video Games*, August 6, 2018, http://www.vgarc.org/vgarc-originals/the-clones-of-donkey-kong/.

4. The idea of a hibernation belongs primarily to popular histories of the genre, such as Nodwin Gaming, "The Evolution of Platform Games in 9 Steps," *Redbull*, March 23, 2017, https://www.redbull.com/in-en/evolution-of-platformers; New York Film Academy, "Genre Revival: 2D Platformers" *New York Film Academy*, November 21, 2014, https://www.nyfa.edu/student-resources/genre-revival-2d-platformers/; Matthew Byrd, "How the 2D Platformer Survived the 3D Revolution," *Den of Geek*, September 29, 2017, https://www.denofgeek.com/games/how-the-2d-platformer-survived-the-3d-revolution/; Gamerforlife, "Platform Games 101: Running, Jumping, and More," *Racket Boy*, February 16, 2011, http://www.racketboy.com/retro/platforming-games-101-all-you-need-to-know.

5. For a closer look at these hybrid platformers, see Daniel Boutros, "A Detailed Cross-Examination of Yesterday and Today's Best-Selling

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Platform Games," *Game Developer*, August 6, 2006, https://www.gamasutra.com/view/feature/1851/a_detailed_crossexamination_of_.php.

6. ROM hacking is a critical way of engaging with games that has a long history of reshaping platforming games in particular; see Stephanie Boluk and Patrick LeMieux, *Metagaming* (Minneapolis: University of Minnesota Press, 2017), 191–202.

7. The role of platforming games as a first stepping stone to learning both Flash and game design is detailed in Anastasia Salter and John Murray, "Platform/er Programming," in *Flash: Building the Interactive Web* (Cambridge, MA: MIT Press, 2014), 43–64.

8. Platforming games are not always included in the core genres that define contemporary gamer identity, but nonetheless form a nostalgic reference point through which group membership is negotiated. The backlash that Anita Sarkeesian received during Gamergate for her analysis of the princess trope shows a particular connection between platformers and misogyny. On the construction of gamer identity, see Adrienne Shaw, "On Not Becoming Gamers," *Ada: Gender, New Media and Technology* 2 (2013): n.p.

9. Three variations of high-level categorization appear in Claus Pias, *Computer Game Worlds*, trans. Valentine Pakis (Zurich: Diaphenes, 2017); David Myers, *The Nature of Computer Games* (New York: Peter Lang, 2003); Thomas Apperley, "Genre and Game Studies," *Simulation and Gaming* 37, no. 1 (2006): 6–23.

10. The criticisms that Tzvetan Todorov levels against Northrop Frye's archetypal criticism are applicable here. Tzvetan Todorov, *The Fantastic*, trans. Richard Howard (Ithaca, NY: Cornell University Press, 1975), 11–21.

11. Todorov, *The Fantastic*, 33.

12. Todorov, *The Fantastic*, 6.

13. Fredric Jameson, *The Political Unconscious* (Ithaca, NY: Cornell University Press, 1982), 146.

14. To my mind, the best articulation of the methodological presuppositions of structuralism can be found in Gilles Deleuze, "How Do

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We Recognize Structuralism?" in *Desert Islands and Other Texts, 1953–1974* (Los Angeles: Semiotext(e), 2004), 170–192.

15. Ferdinand de Saussure, *Course in General Linguistics*, trans. Wade Baskin (New York: Columbia University Press, 2011), 113.

16. Clear examples of this conflation can be found in George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore, MD: Johns Hopkins University Press, 1992); Michael Joyce, *Of Two Minds: Hypertext Pedagogy and Poetics* (Ann Arbor: University of Michigan Press, 1996); J. David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 1999); Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001); Marie-Laure Ryan, *Narrative as Virtual Reality* (Baltimore, MD: Johns Hopkins University Press, 2001).

17. Espen Aarseth, *Cybertext* (Baltimore, MD: Johns Hopkins University Press, 1997), 25–32.

18. Murray is less direct than Aarseth, but her description of "the suits . . . [who] no longer saw the novel as the 'bright book of life' but as an infinite regression of words about words" is clearly a reference to structuralist and poststructuralist critics. Murray's narratology stands at a distance from the structuralist narratology of Gerard Genette with its focus on written media. Janet Murray, *Hamlet on the Holodeck* (New York: Free Press, 1997), 4.

19. For a summary and continuation of this discussion, see, for instance, Jan Simons, "Narrative, Games, and Theory," *Game Studies* 7, no. 1 (2007): n.p.

20. Marie-Laure Ryan describes this text centric bias in narratology in *Avatars of Story* (Minneapolis: University of Minnesota Press, 2006).

21. There have been recent proposals to examine video games through cybersemiotics, morphic semiotics, multimodal semiotics, and social semiotics. Juan J. Vargas-Iglesias, "Making Sense of Genre: The Logic of Video Game Genre Organization," *Games and Culture* 15, no. 2 (2020): 158–178; D. Fox Harrell, *Phantasmal Media* (Cambridge, MA: MIT Press, 2013); Jason Hawreliak, *Multimodal Semiotics and Rhetoric in Videogames* (New York: Routledge, 2019); Óliver Pérez-Latorre,

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Mercè Oliva, and Reinald Besalú, "Videogame Analysis: A Social-Semiotic Approach," *Social Semiotics* 27, no. 5 (2017): 586–603.

22. Ian Bogost, *Persuasive Games* (Cambridge, MA: MIT Press, 2007).

23. Roy Harris, *Language, Saussure, and Wittgenstein: How to Play Games with Words* (New York: Routledge, 1988).

24. See Thierry Wendling, "Une Joute intellectuelle au détriment du jeu? Claude Lévi-Strauss vs. Roger Caillois (1954–1974)," *Ethnologies* 32.1 (2010): 29–49; Algirdas Greimas and François Rastier, "The Interaction of Semiotic Constraints," *Yale French Studies* 41 (1968): 86–105; Eve Tavor, "Critical Play: A Reading of Roland Barthes," *Orbis Litterarum* 36, no. 1 (1981): 1–12.

25. *Play* is a major term in the poststructural work of Jacques Derrida, Jean-François Lyotard, and Gilles Deleuze, among others.

26. Criticisms of structuralism include that it reduces all difference to binary oppositions; it overemphasizes static and unchanging systems; it produces coherence where there is actually multiplicity and divergence; it minimizes the creative contributions of individuals; and it projects ideological constructs into the world. Two lucid articulations of these and other problems can be found in Julia Kristeva, "Semiotics: A Critical Science and/or a Science of Critique," in *The Kristeva Reader*, ed. Toril Mor (Oxford: Blackwell, 1986), 74–88; and Thomas Heller, "Structuralism and Critique," *Stanford Law Review* 36, no. 1/2 (1984): 127–198.

27. Here I am following Aubrey Anable's argument that historicizing the early moments of our field can reveal foreclosed modes of inquiry. Aubrey Anable, *Playing with Feeling* (Minneapolis: University of Minnesota Press, 2018), 25–34.

Chapter 1

1. I am indebted to Anna Anthropy and Naomi Clark for presenting a clear and expansive version of the idea that games are languages. Anna Anthropy and Naomi Clark, *A Game Design Vocabulary* (Upper Saddle River, NJ: Addison-Wesley, 2014).

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2. Ludemes have been the subject of several competing definitions. For David Parlett, the term is associated with structuralism and memes. For Raph Koster, they are best understood as an abstract notation system for game design. For Espen Aarseth, they are a broad class of signifiers pointing toward computational operations. David Parlett, "What's a Ludeme?" *Game and Puzzle Design* 2, no. 2 (2016): 81–84; Raph Koster, "A Grammar of Gameplay," *Game Developer's Conference* (San Francisco, CA, USA, March 7–11, 2005), https://www.gdcvault.com/play/1019985/Game-Design-Atoms-Can-Game; Espen Aarseth, "Fictionality Is Broken," *Philosophy of Computer Games Conference* (Bergen, Norway, October 2–4, 2013), https://www.youtube.com/watch?v=e8gsgLHKWeA.

3. Brendan Keogh, *A Play of Bodies* (Cambridge, MA: MIT Press, 2018), 89–95.

4. As Iris Marion Young notes in an essay whose interest in parabolic arcs and intentional aims makes it of central relevance here, that literacy can also develop into an "I cannot" if the player's relationship to the digital body is inhibited. Iris Marion Young, *Throwing Like a Girl and Other Essays in Feminist Philosophy and Social Theory* (Bloomington: Indiana University Press, 1990), 148–149.

5. Anthropy and Clarke, *A Game Design Vocabulary*, 15.

6. Nis Bojin, "Ludemes and the Linguistic Turn," in *Futureplay '10: Proceedings of the International Academic Conference on the Future of Game Design and Technology* (New York: Association for Computing Machinery, 2010), 26.

7. Not all platformers allow the player to change motion after initiating a jump. For an exploration of such "air control," see Ian Bryce Jones, "Special Effectivities," *Transition: Journal of Videographic Film and Moving Image Studies* 6, no. 3 (2019), as well as Ian Bryce Jones, "Enough of a World: A Phenomenology of Videogame Weltlichkeit" (PhD diss., University of Chicago, 2015).

8. See, for instance, Claus Pias's description of gravity and parabolic arcs in William Higginbotham's *Tennis for Two* (1958). Claus Pias,

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Computer Game Worlds, trans. Valentine Pakis (Germany: Diaphanes, 2017).

9. Patrick Holleman, *Reverse Design: Super Mario World* (Boca Raton, FL: CRC Press, 2019), 8–9.

10. The idea that meaning could be defined differentially rather than as a one-to-one connection between word and concept is central to the foundational work of Ferdinand de Saussure in structuralist linguistics in his *Course in General Linguistics*, trans. Wade Baskin (New York: Columbia University Press, 2011).

11. Roland Barthes, *Elements of Semiology*, trans. Annette Lavers and Colin Smith (New York: Noon Day Press, 1968), 51.

12. Barthes, *Elements of Semiology*, 41

13. See Steve Swink, *Game Feel: A Game Designer's Guide to Virtual Sensation* (Boca Raton, FL: CRC Press, 2009).

14. Martin Fasterholdt, Martin Pichlmair, and Christoffer Holmgård, "You Say Jump, I Say How Hight? Operationalizing the Game Feel of Jumping," in *Proceedings of the First International Joint Conference of DiGRA and FDG* (Dundee, Scotland, August 2016), 1–16, http://www.digra.org/wp-content/uploads/digital-library/paper_248.pdf.

15. For a version of this method, see Daniel Johnson, *Game Design Companion: A Critical Analysis of Wario Land 4* (self-published, 2013), 117–142, https://danielprimed.com/warioland4/.

16. Noah Wardrip-Fruin, *How Pac-Man Eats* (Cambridge, MA: MIT Press, 2020), 47.

17. Louis Hjelmslev, *Prolegomena to a Theory of Language*, trans. Francis Whitfield (Madison: University of Wisconsin Press, 1961), 116–119.

18. With the exception of a situation-specific jump that requires bouncing off spinning foes.

19. Jason Begy has drawn on cognitive metaphor theory to argue that there is an inherent and bodily association between goodness and up. Whether such metaphors are universal, it is easy enough to point out individual games that invert this relationship or render it moot, as

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in *VVVVVV*. Jason Begy, "The History and Significance of Jumping in Games," in *GAME//PLAY//SOCIETY: Contributions to Contemporary Computer Game Studies*, (Munich: Kopead, 2010), 83–96.

20. See Chris Carloy, "True 3D: The Form, Concept, and Experience of Three-Dimensionality in 1990s Videogames" (PhD. diss., University of Chicago, 2018).

21. As Kyra Gaunt argues, the rhythms and embodied practices of jumping in double Dutch can be central to a player's sense of identity, community building, and aesthetic practices. Kyra Gaunt, *The Games Black Girls Play* (New York: New York University Press, 2006).

22. De Saussure, *Course in General Linguistics*, 136.

23. Christopher Goetz, *The Counterfeit Coin: Videogames and Fantasies of Empowerment* (New Brunswick, NJ: Rutgers University Press, 2023), 30.

Chapter 2

1. Roland Barthes, *Elements of Semiology*, trans. Annette Lavers and Colin Smith (New York: Noon Day Press, 1968), 82.

2. Roman Jakobson, C. Gunnar, M. Fant, and Morris Halle, *Preliminaries to Speech Analysis* (Cambridge, MA: MIT Press, 1952), 9–11.

3. Claude Lévi-Strauss, "The Structural Study of Myth," *Journal of American Folklore* 68, no. 27 (1955), 443.

4. Joaquìn Siabra-Fraile argues something similar about the dichotomous relationship of platforming game space by starting from a reading of game objects as signs. Joaquìn Siabra-Fraile, "Manic Miner under the Shadow of the Colussus: A Semiotic Analysis of the Spatial Dimension in Platform Video Games," *E/C Serie Speciale* 3, no. 5 (2009), 67–74.

5. For a historical account of this developing connection between space and narration in platforming games, see Jennifer deWinter, "Spatial Narratives: Characters in Their Worlds," in *Shigeru Miyamoto* (New York: Bloomsbury, 2015).

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6. Gareth Damian Martin, "The Poetics of Progress," *Heterotopias* 1 (2017), 50.

7. For instance, see Michael Nitsche, *Video Game Spaces* (Cambridge, MA: MIT Press, 2008), 118–119.

8. It is often referred to as a "cut" as well. Nitsche, *Video Game Spaces*, 119.

9. Jacob Gaboury, "Hidden Surface Problems: On the Digital Image as Material Object," *Journal of Visual Culture* 14, no. 1 (2015), 40–60.

10. David Sudnow, *Pilgrim in the Microworld* (New York: Warner Books, 1983), 37.

11. I am drawing on Laura Marks's theoretical work connecting visuality and tactility in a kind of affective synesthesia. Laura Marks, *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses* (Durham, NC: Duke University Press, 2000).

12. Patrick Jagoda gives a complicated reading of these background and interstitial figures in Jonathan Blow's *Braid*. Patrick Jagoda, "Fabulously Procedural: Braid, Historical Processing, and the Videogame Sensorium," *American Literature* 85, no. 4 (2013), 745–779.

13. Itay Keren provides the most complete overview of camera design for 2D games in Itay Keren, "Scroll Back: The Theory and Practice of Cameras in Side-Scrollers," *Game Developer*, November 5, 2015, https://www.gamedeveloper.com/design/scroll-back-the-theory-and-practice-of-cameras-in-side-scrollers.

14. The dialectic of control and freedom as it is expressed within new media is laid out clearly by Wendy Chun in *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (Cambridge, MA: MIT Press, 2006).

Chapter 3

1. Mel Chen shows how a grammatical distinction between things that are more alive or more dead, called animacy, informs people's views of liveness. I adapt this semiotic approach account for the

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player's feeling of liveness. Mel Chen, *Animacies: Biopolitics, Racial Mattering, and Queer Affect* (Durham, NC: Duke University Press, 2012).

2. Jesse Schell describes the trap of designers forgetting about experience in *The Art of Game Design* (Boca Raton, FL: CRC Press, 2015), 55.

3. Scott Rogers, *Level Up! The Guide to Great Video Game Design* (Chicester, West Sussex: Wiley, 2010); Garret Bright, "Build a Bad Guy Workshop" *Game Developer*, April 4, 2014, https://www.gamedeveloper.com/design/build-a-bad-guy-workshop---designing-enemies-for-retro-games; Gabriel Rivera, Kenneth Hullet, and Jim Whitehead, "Enemy NPC Design Patterns in Shooter Games," in *Proceedings of the First Workshop on Design Patterns in Games* (Raleigh, NC, May 2012).

4. Carly Kocurek makes a related argument about attempts to minimize violence by visually transforming it through devices like green alien blood. She argues that this in fact creates a secondary violence of dehumanizing the enemy. Carly Kocurek, "Who Hearkens to the Monster's Scream? Death, Violence and the Veil of the Monstrous in Video Games," *Visual Studies* 30, no. 1 (2015): 79–89.

5. Nicola Liberati argues that perceiving a digital entity as a real "other" requires that it must be engaged in the same world of concerns, and it must resist us. Nicola Liberati, "Facing the Digital Partner: A Phenomenological Analysis of Digital Otherness," *Glimpse* 19 (2018): 99–107.

6. Ferdinand de Saussure, *Course in General Linguistics*, trans. Wade Baskin (New York: Columbia University Press, 2011), 9.

7. The resonance I am drawing here is with Michel Foucault's concept of discourse as the conditions that structure the historical possibility of thought. Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (New York: Vintage Books, 2010).

8. On the interactions that arise between the two senses of ontology, see D. Fox Harrell, *Phantasmal Media* (Cambridge, MA: MIT Press, 2013), 78–81.

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9. Émile Benveniste, *Problems in General Linguistics* (Miami: University of Miami Press, 1971), 55–65.

10. I include Flamer, Lift Cannon, Rolling Gabyool, Slide Cannon, and Turn Cannon as varieties of canon.

11. Dashers include Amenhopper, Ball de Voux, Batton Bone, Batton M-501, Creeper, Hotarion, Iworm, Jamminger, Ray Bit, Rush Roader, Sea Attacker, Spiky, and Tombot. Gulpfer and Sky Claw form a small subtype within this. Shooters include: Axe Max, Crag Man, Dig Labour, Flammingle, Gun Volt, Mega Tortoise, Scrap Robo, and Snow Shooter.

12. For a critical review of how these questions interact with artificial intelligence, see Katherine Hayles, *How We Became Post-Human* (Chicago: University of Chicago Press, 1999).

13. K. T. Fann, *Peirce's Theory of Abduction* (The Hague, Netherlands: Martinus Nijhoff, 1970).

14. For a description of the mechanical consequences of such attacks, see Mike Stout, "Enemy Attacks and Telegraphing," *Game Developer*, September 2, 2015, https://www.gamedeveloper.com/design/enemy-attacks-and-telegraphing.

15. Ernest Adams and Joris Dormans, "Internal Economy," in *Game Mechanics: Advanced Game Design* (Indianapolis, IN: New Riders, 2012), 59–78.

16. De Saussure, *Course in General Linguistics*, 115–116.

17. The perspective I take here can be usefully put in conversation with Miguel Sicart's description of the player reflecting procedural arguments about ethics. I am concerned instead with a prereflective production of ethical reactions. Miguel Sicart, *Ethics of the Computer Game* (Cambridge, MA: MIT Press, 2009), 36–37.

18. This feeling is similar to Mia Consalvo's investigation of unfairness. Mia Consalvo, *Cheating: Gaining Advantage in Video Games* (Cambridge, MA: MIT Press, 2007), 87–90.

19. Bright, "Build a Bad Guy Workshop."

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Chapter 4

1. Roland Barthes, *Mythologies*, trans. Annette Lavers (London: Paladin Books, 1973), 124.

2. In a wonderful reading of *Katamari Damacy* (2004), McKenzie Wark argues that collecting is paradigmatic of video games and late capitalism in its transformation of everything that is unique into a simple numerical score. While Wark shares my sense that the nature of the collected object is of minor importance, she nonetheless emphasizes "having collected" over the act of collecting. Conversely, Steven Jones reads the same collecting and argues that each object is important as a way of individualizing collecting as a creative act. Platforming games focus on the act but deemphasize the object. McKenzie Wark, *Gamer Theory* (Cambridge, MA: Harvard University Press, 2007); Steven Jones, *The Meaning of Video Games* (New York: Routledge, 2008).

3. This is supported by a study that found that placebo power-ups still attracted players. Alena Denisova and Eliott Cook, "Power-Ups in Digital Games: The Rewarding Effect of Phantom Game Elements on Player Experience" *CHI PLAY '19: Proceedings of the Annual Symposium on Computer-Human Interaction in Play* (New York: Association for Computing Machinery, 2019), 161–168. https://doi.org/10.1145/3311350.3347173.

4. Richard Terrell, "The Measure of Mario Part 5: Coins," *Critical Gaming Network* (November 30, 2009), http://critical-gaming.com/blog/2009/11/30/the-measure-of-mario-pt5.html.

5. David Sirlin, "The Secrets of Donkey Kong Country 2," *Sirlin on Game Design* (March 22, 2010), http://www.sirlin.net/articles/the-secrets-of-donkey-kong-country-2.

6. For a breakdown of different definitions of power-ups, see Filip Lange-Nielsen, "The Power-Up Experience," in *Proceedings of DiGRA 2011 Conference: Think Design Play* (2011), http://www.digra.org/wp-content/uploads/digital-library/11312.13136.pdf.

7. Richard Terrell, "The Measure of Mario Part 6: Power-Ups," *Critical Gaming Network* (December 3, 2009), http://critical-gaming.com/blog/2009/12/3/the-measure-of-mario-pt6.html.

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8. Stephanie Boluk and Patrick LeMieux make this point about the virtuosic range of power-ups in the Kirby series, but the difference from other platformers is only one of degree. Stephanie Boluk and Patrick LeMieux, *Metagaming* (Minneapolis: University of Minnesota Press, 2017), 51.

9. Many fan games combine characters from different franchises in precisely this way. For instance, see *Mega Man in the Mushroom Kingdom* (2006) and *Mushroom Kingdom Fusion* (2019).

10. Richard Terrell, "The Measure of Mario Part 7: Locks and Secrets," *Critical Gaming Network* (December 5, 2009), http://critical-gaming.com/blog/2009/12/5/the-measure-of-mario-pt7.html.

11. Sirlin, "Secrets of Donkey Kong Country 2."

12. Jeff Howard, "Occult Game Design," *Game Developers Conference* (2012), https://www.gdcvault.com/play/1016560/Occult-Game-Design-An-Initiation.

13. Here we approach the limits of semiotics, where the pragmatic and contextual elements intrude and transform games from fixed systems of meaning into what Boluk and LeMieux call "equipment for making metagames." Boluk and LeMieux, *Metagaming*, 9.

14. In an interview, Loren Schmidt describes the game as stemming from "a couple of little seeds, one of which was that I wanted to make a game about my relationship with my grandmother, who suffered from Alzheimer's Disease." Mike Rougeau and Loren Schmidt, "Games for Adults: 'Strawberry Cubes' Isn't Nearly as Random as It Seems," Playboy.com (October 13, 2015), https://web.archive.org/web/20171006014006/https://www.playboy.com/articles/games-for-adults-strawberry-cubes.

Conclusion

1. Kiri Miller, *Playing Along: Digital Games, YouTube, and Virtual Performance* (New York: Oxford University Press, 2012); Celia Pearce, *Communities of Play: Emergent Cultures in Multiplayer Games and Virtual Worlds* (Cambridge, MA: MIT Press, 2009); T. L. Taylor, *Watch Me*

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Play: Twitch and the Rise of Game Live Streaming (Princeton, NJ: Princeton University Press, 2018).

2. Bruno Latour, "Has Critique Run Out of Steam: From Matters of Fact to Matters of Concern," *Critical Inquiry* 30, no. 2 (2004): 225–248.

3. Nick Montfort and Ian Bogost, *Racing the Beam: The Atari Video Computer System* (Cambridge, MA: MIT Press, 2009), 110–111.

4. For a more specific breakdown of Pitfall's level construction, see Jack Evoniuk, "How Pitfall Builds Its Worlds," *Just Some Thoughts* (May 8, 2021), https://evoniuk.github.io/posts/pitfall.html.

5. Bogost and Montfort, *Racing the Beam*, 89.

6. J. L. Austin, *How to Do Things with Words* (New York: Oxford University Press, 1962).

7. Jacques Derrida, *Limited Inc.* (Evanston, IL: Northwestern University Press, 1988).

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